

United States. Patent Office

Edison	}	Interference No.
vs.		25,677.
Macdonald		Phonic Apparatus

EDISON TESTIMONY; MACDONALD RECORD
AND VARIOUS BRIEFS
1906-07.

UNITED STATES PATENT OFFICE

Edison	)	Interference
	)	Number 25,677.
<u>vs.</u>	)	
Macdonald	)	PHONIC
	)	APPARATUS.

1906 -- 1907.

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United States Patent Office.

EDISON
vs.
MACDONALD.

INTERFERENCE

No. 25,677.

EDISON'S TESTIMONY AND PAPER
EXHIBITS.

FRANK L. DYER,

For Edison.

C. G. Burgoyne, Walker and Centre Streets, N. Y.

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UNITED STATES PATENT OFFICE.

EDISON
vs.
MACDONALD.

Interference
No. 25,677.

Issue.

COUNT 1. In a phonic apparatus, the combination of a phonographic recording surface, means for rotating said surface, a carrier movable across said surface, a phonographic stylus and friction wheel carried by the carrier, a friction member connected to said stylus and pressing against the friction wheel, and means representative of sound vibrations for varying the friction between said friction member and friction wheel.

COUNT 2. In a phonic apparatus, the combination of a traveling carriage, a friction wheel and phonographic stylus carried thereby, a friction member pressing on said wheel and connected to said stylus, means for driving said friction wheel and means representative of sound vibrations for varying the amount of friction between the friction member and friction wheel.

COUNT 3. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, and com-

mon driving means for moving the carriage and rotating the friction wheel.

COUNT 4. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, common driving means for moving the carriage and rotating the friction wheel, and means representative of sound vibrations for varying the friction between the friction member and friction wheel.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON

vs.

THOMAS H. MACDONALD.

Interference
No. 25,677.**Preliminary Statement of Thomas A.
Edison.**STATE OF NEW JERSEY, }
County of Essex, } ss. :

THOMAS A. EDISON, of Llewellyn Park, Orange, in the County of Essex and State of New Jersey, being duly sworn, doth depose and say that he is a party of the interference declared by the Commissioner of Patents February 6th, 1906, between his application for letters patent filed September 15th, 1905, serial No. 278,549 for recording telephones, and an application filed by Thomas H. Macdonald for phonic apparatus referred to therein; that he conceived the invention contained in claims 3, 4, 5 and 6 of his said application Serial No. 278,549 during the month of April, 1902; that during the month of April, 1902, he made a number of experiments for the purpose of demonstrating, and did demonstrate, the operativeness and utility of the said invention; that during the month of April, 1902, he made sketches of the invention, and at that time first explained the invention to others; that in the month of May, 1902, full sized working drawings of the invention were made; that on May 31st, 1902, the construction of a full sized apparatus

embodying the said invention was commenced, and said full sized apparatus was completed in the month of June, 1902; that he made no other apparatus embodying the invention, nor was any model of the same constructed.

THOMAS A. EDISON.

Subscribed and sworn to be-
fore me this 23d day of }
February, 1906.

FRANK L. DYER,
Notary Public.

[SEAL.]

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON

vs.

THOMAS H. MACDONALD.

Interference
No. 25,677.

MESSRS. MAURO, CAMERON, LEWIS & MASSIE,
620 F Street, Washington, D. C.

GENTLEMEN:—You are hereby notified that on Tuesday, July 24, 1906, at my office, Edison Laboratory, West Orange, New Jersey, at 10:30 in the forenoon, I shall proceed to take the testimony of Thomas A. Edison, Frederick P. Ott, John F. Ott, and John F. Randolph, all of West Orange, New Jersey, and possibly others, as witnesses in behalf of Thomas A. Edison. The examination will continue from day to day until completed. You are invited to attend and cross-examine.

Very respectfully,

FRANK L. DYER,

Attorney for Edison.

Dated Orange, N. J., July 13, 1906.

Timely service of the above notice accepted this
16th day of July, 1906.

MAURO, CAMERON, LEWIS & MASSIE,

Attorneys for Macdonald.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON

vs.

THOMAS H. MACDONALD.

Interference
No. 25,677.

Testimony on behalf of Thomas A. Edison taken at the Edison Laboratory, West Orange, N. J., commencing Tuesday July 24, 1906, at 10:30 A. M., before HERBERT W. KNIGHT, Esq., a Master in Chancery of New Jersey and Special Examiner by consent, pursuant to the annexed notice.

Present—

FRANK L. DYER, Esq., for Thomas A. Edison.

C. A. L. MASSIE, Esq., for Thomas H. Macdonald.

Ludwig F. Ott.

LUDWIG F. OTT, a witness produced on behalf of Thomas A. Edison, being first duly sworn and asked questions by MR. DYER, deposes as follows :

Q. 1. Give your name, age, residence and occupation.

A. My name is Ludwig F. Ott; I am 24 years of age, residing at 175 High Street, Orange, N. J. My occupation is making experiments.

Q. 2. Are you employed by Mr. Edison?

A. Yes, sir.

Q. 3. When did you leave school?

A. I left school in 1902, I graduated in that year.

Q. 4. Prior to leaving school did you ever do any experimental work in the Edison laboratory?

A. I did experimental work at the Edison laboratory during summer vacations prior to leaving school.

Q. 5. Before leaving school did you ever do any experimental work at the Edison laboratory in connection with schemes for recording telephone messages with phonographs?

A. Yes, sir.

Q. 6. Do you recall when that was?

A. I could not recall exactly but it was prior to 1902.

Q. 7. What did the experiments you have referred to consist of?

A. The experiments consisted of a phonograph in one room which had attached to it a telephone transmitter and another phonograph in another room having attached to it a telephone receiver; simply connected the telephone receiver and the transmitter to a regular phonograph speaker on one end and a recorder on the other, and then we had a battery and coil interposed between the two instruments, also a magnetic arrangement for releasing the governor on both machines simultaneously when the telephone was started. We had a separate battery and line for operating the magnetic starting device of both machines.

Q. 8. What was the idea of this experiment?

A. The main idea was to use it in telegraphing, substituting the telephone for a telegraph in railroad stations so that there would be no mistake in the messages received and a record of them could be kept.

Q. 9. I call your attention to a number of pieces of apparatus in this room and ask you if you find here the machines with which you experimented prior to the year 1902?

A. There are two machines here which I experimented with, one is the telephone transmitter and the other is the later style of recorder.

Q. 10. Please point out the transmitting instrument?

A. The transmitting instrument is the one to the right.

The machine referred to by the witness is offered in evidence and marked, "Edison's Exhibit, First Transmitter."

Q. 11. Please consider this machine a little more in detail than you have done and describe its construction and operation.

A. The machine consists of an ordinary Standard phonograph equipped with the usual reproducer and over this reproducer is mounted a common form of carbon telephone transmitter. The phonograph is operated by a spring motor, and a magnet is used in a separate circuit for starting and stopping the motor. In operating this particular machine I placed a phonograph record on the mandrel so that when the phonograph was started the phonograph reproducer would speak into the telephone and the record thereby be transmitted over the line. I used all sorts of records in these experiments, both musical and talking.

Q. 12. Please point out the receiving instrument?

A. The receiving instrument is the one to the left.

The machine last referred to by the witness is offered in evidence and marked "Edison's Exhibit, First Receiver."

Q. 13. Please also describe this machine?

A. The receiving instrument is a similar phonograph to that used with the transmitter except that it was provided with an ordinary recorder adapted to make a record on a blank cylinder; the magnetic device is also employed for starting and stopping the motor. At first I used an ordinary telephone receiver which was mounted over the recorder so that when the message was received over the line it would be delivered to the

diaphragm of the recorder and thereby make a record, but I found that such a record was very faint and at Mr. Edison's suggestion therefore the form of receiver at present on the machine was constructed. With this receiver the diaphragm, which was vibrated by the receiving magnet, was connected directly with the recording stylus of the phonograph so that there was less opportunity for mechanical loss and consequently the records made were considerably louder. The diaphragm used with this receiver is a steel or iron diaphragm like the ordinary diaphragm of a telephone receiver.

Q. 14. Do I understand that these experiments were made by you prior to or after the year 1902 ?

A. I think they were made prior to the year 1902.

Q. 15. That was before you left school ?

A. Before I left school. Yes, they were, before I left school.

Q. 16. And with the machines exactly as they are now constructed, prior to that time ?

A. The same construction and the same machine.

Q. 17. How successful were the experiments which you made with these machines ?

A. With the first form of recorder we were able to distinguish the words by means of an ear tube ; with the second form of recorder, which is the one now on the machine, we were able to distinguish the words by means of a horn, showing that they were very much louder.

Q. 18. In a statement which I propose to subsequently introduce, taken from the books of the Edison Laboratory, it appears that in connection with experiment number 1148 entitled " Railway telephone experiments for block signals," you were employed on that experiment in the months of July and August of 1901. Did you do any other experimenting on the use of telephones for railway block signals other than in connection with the two machines which have been

introduced in evidence and to which you have previously referred ?

Question objected to as incompetent and without having sufficient foundation.

A. I did not experiment on other machines further than setting up a line to connect the reproducing instrument with a chalk telephone ; but this was later than the experiments which I made with the two machines which have been introduced as exhibits.

Counsel for Macdonald objects to the entire deposition of this witness as irrelevant and immaterial and gives notice of a motion to suppress the same.

He further objects to the two exhibits, as irrelevant, immaterial and not sufficiently proved.

No cross-examination.

(By consent the signature was waived).

John F. Ott.

JOHN F. OTT, a witness produced on behalf of Thomas A. Edison being first duly sworn and asked questions by Mr. Dyer deposes as follows :

Q. 1. State your name, age, residence and occupation ?

A. My name is John F. Ott, I am fifty six years old, I reside at 75 High Street, Orange, N. J., and my occupation is that of Superintendent of the Edison Laboratory.

Q. 2. How long have you been connected with Mr. Edison ?

A. Since 1869.

Q. 3. What are your duties in the Edison Laboratory ?

A. Getting out such sketches or designs as Mr. Edison gives us ; seeing that proper drawings are made of them and that they are given to the workmen to work out.

Q. 4. Your work is to supervise the manufacture of experimental apparatus ?

A. That is it.

Q. 5. I call your attention to a machine that has been offered in evidence and marked " Edison Exhibit, First Transmitter " and ask you if you had anything to do with its construction ?

A. Yes, I had.

Q. 6. Was this machine constructed under your direction ?

A. Yes, sir.

Q. 7. Do you know the purpose of this machine ?

A. The purpose of this machine is to transmit a message from a phonograph record to a telephone transmitter in connection with the system of railroad signaling that Mr. Edison was working on.

Q. 8. I call your attention to another machine which has been offered in evidence and marked as an exhibit in this case (" Edison's Exhibit, First Receiver ") and ask you if you had anything to do with the construction of this machine ?

A. Yes, sir.

Q. 9. Was this machine constructed under your direction ?

A. Yes, sir.

Q. 10. What was its purpose ?

A. The purpose of this machine is to record on a blank cylinder, messages transmitted over the line from the other machine " Edison's Exhibit, First Transmitter."

Q. 11. Did you witness the experiments with these two machines concerning which you have just testified ?

A. Part of them.

Q. 12. Please tell what you remember about the experiments ?

A. The wire ran from one room into another, one instrument was set up in one room and the other in the other room and we transmitted messages across, from the transmitter to the receiver.

Q. 13. Do you know what the purpose was of transmitting a telephone message and recording it on the phonograph blank so as to form a permanent record?

A. The purpose was that in block signaling or freight orders the message could be given over the telephone and a record made of it which could be kept as a permanent record.

Q. 14. I call your attention to a piece of apparatus and ask you to tell what it is, and if you had anything to do with its construction?

A. This is a receiver with two chinks and one diaphragm, so as to increase the volume of sound. I made this machine.

Q. 15. By "receiver" do you mean telephone receiver?

A. Yes, telephone receiver.

The instrument last referred to by the witness is offered in evidence and marked "Edison's Exhibit, First Chalk Receiver."

Objected to as irrelevant and immaterial and not sufficiently proved.

Q. 16. Can you produce a sketch from which "Edison's Exhibit, First Chalk Receiver" was made?

A. Yes, sir; I produce Mr. Edison's original sketch.

Q. 17. On what portion of this sketch is the double chalk receiver illustrated?

A. On the top of the sheet.

Q. 18. I notice on this sketch the words "John—make these"; in whose handwriting are those words?

A. Mr. Edison's.

Q. 19. To whom is the note addressed?

A. To me.

Q. 20. On this sketch I have made certain repre-

sentative letters in ink and I will ask you to kindly refer to the same and tell me what they relate to?

A. The letter *a* is the diaphragm, the letters *bb* are the two chalk cylinders, the letters *cc* are the connections of the chalk cylinders, and the letters *dd* are the metallic springs connected to the diaphragm and which rest on the chalk.

Q. 21. Is this general scheme of making a telephone receiver by causing an electrode to press upon a rotating chalk cylinder in such a way that the electrical impulses will vary the friction between the electrode and the chalk cylinder, a new suggestion in recent years?

Objected to as leading.

A. No; that is the ordinary chalk receiver or motograph that Mr. Edison invented in the seventies.

Q. 22. I observe on this same sketch the drawing of another device in which a single chalk cylinder was used. What was this apparatus?

A. It is similar to the one above only it has a single chalk cylinder.

Q. 23. I notice on this sketch the impression by a rubber stamp of the name "J. F. Ott"; did you make that impression on the sketch?

A. I stamped that on.

Q. 24. Is it your custom to stamp your names on sketches handed to you by Mr. Edison?

A. Yes, sir.

Q. 25. Does your handwriting appear anywhere upon this sketch?

A. Yes, sir; the date.

Q. 26. What is that date?

A. May, 1902.

Q. 27. What is your custom in reference to dating of sketches?

A. So that we know when the sketches are handed in to us and have a record of them.

Q. 28. Are you able to say that this sketch was in your possession in May, 1902?

A. Yes, sir.

Q. 29. Are you able to say whether, except for the stamped impression and date on this sketch, the drawing and handwriting thereon were made by Mr. Edison?

A. Yes, sir; they were made by Mr. Edison.

The sketch referred to by witness is offered in evidence and marked "Edison's Exhibit, Sketch of Chalk Receivers."

Exhibit objected to as irrelevant and immaterial.

Q. 30. Did you ever make a chalk receiver or motograph with one chalk cylinder similar to the drawing in the centre of the sheet, "Edison's Exhibit, Sketch of Chalk Receivers?"

A. I did.

Q. 31. Please produce the same?

A. This is the machine.

Q. 32. How does this machine differ from "Edison's Exhibit, First Chalk Receiver"?

A. It is made with a smaller chalk and smaller diaphragm, and only a single chalk is used. We afterwards found that the smaller diaphragms were more sensitive to faint articulations than the larger diaphragms; that is to say, it would bring them out sharper.

The chalk receiver last referred to by the witness is offered in evidence and marked "Edison's Exhibit, Second Chalk Receiver."

Exhibit objected to as irrelevant and immaterial.

Q. 33. Did you have anything to do with the construction of the two chalk receivers which have been introduced as exhibits herein as "Edison's Exhibit,

First Chalk Receiver" and "Edison's Exhibit, Second Chalk Receiver"?

A. Yes, sir; they were built under my direction.

Q. 34. Can you state when those two chalk receivers were constructed under your directions?

A. It was about the time of the date of "Edison's Exhibit, Sketch of Chalk Receiver," namely, May, 1902.

Q. 35. Were the two machines, "Edison's Exhibit, First Transmitter" and "Edison's Exhibit, First Receiver," constructed before or after the two chalk receivers?

A. That I cannot remember; it was about the same time; they were very close together.

Q. 36. I have marked on the central figure of "Edison's Exhibit, Sketch of Chalk Receiver" some reference letters in red ink and I will ask you to please state what those letters refer to?

A. The letter *a* is the diaphragm; letter *b* is the chalk cylinder; letter *c* is the electrode pressing upon the chalk cylinder; the letter *d* is a rubber cushion for regulating the friction between the electrodes and the chalk cylinder, and the letter *e* is an adjusting screw for varying the pressure of the elastic cushion *d*.

Q. 37. On the general subject of recording telephone messages with phonographs did you ever construct for Mr. Edison, or have constructed under your direction for him, any other machine for that purpose than "Edison's Exhibit, First Transmitter"?

A. Yes, sir; I constructed a large machine for that purpose.

Q. 38. Please produce that machine.

A. Here is the original machine.

Q. 39. Please describe this machine briefly and explain its general operations?

A. It is a phonograph driven by an electric motor of the type called the Concert phonograph and having a recorder that is operated with the chalk, the chalk being rotated by an arm extending out on another

drum mounted upon the same shaft as the cylinder, having thereon a little friction roller that rotates the chalk through a little worm and worm gear.

Q. 40. When was this machine built?

A. About May, 1902, as near as I now remember.

Q. 41. Do you remember who worked on this machine, that is, who did the actual practical work?

A. If I am not mistaken I think it was Hofbauer.

Q. 41½. Are you able to state how much time was expended on this machine, how long it took to finish it after it was started?

A. That can be found on the time sheets, but I do not remember.

The machine last referred to by the witness is offered in evidence and marked "Edison's Exhibit, Recording Telephone."

Exhibit objected to as irrelevant and immaterial, and as not sufficiently proven.

Q. 42. Can you produce any sketches illustrating the particular arrangement of driving mechanism disclosed in "Edison's Exhibit, Recording Telephone", wherein a friction wheel is rotated by an auxiliary drum and communicates movement through worm gearing to the chalk cylinder?

A. Yes; these are sketches made by Mr. Edison and they are correct (producing sketches).

Q. 43. On the smaller of these sketches I observe certain writing and dates, together with the impression of a rubber stamp; is this your handwriting?

A. It is, and I applied the stamp of my name.

Q. 44. What does the date, May 29, '02, on this sketch indicate?

A. It indicates the date when I signed the sketch.

Q. 45. Kindly explain the elements of the device shown in the smaller sketch by reference to the letters in red ink which I have placed thereon.

A. The letter *a* represents the ordinary mandrel on

which the blank is placed, the letter *b* is the auxiliary cylinder carried on the mandrel shaft, *c* is the friction roller bearing on the auxiliary cylinder *b* and driven therefrom; the friction roller *c* drives the worm *d* which engages the worm gear *e*; the worm gear *e* drives the shaft *f* on which is mounted the chalk cylinder *g*; engaging with the chalk cylinder is an electrode *h* which is connected with the diaphragm *i* of the recording apparatus. The sketch illustrates the idea of driving the chalk cylinder of an ordinary motograph through the same power that rotates the mandrel. The motograph operates the recording stylus so as to make a permanent record on the blank.

The words "This sketch illustrates" at the close of the answer and the remainder of the answer are objected to as volunteered and incompetent.

Q. 46. Do you recall whether you signed this sketch on the same date that you received it or not?

A. That I cannot say.

Q. 47. The sketch then may have been in the office for some time previous to May 29, 1902?

A. Yes, sir.

The sketch to which the witness last testified is offered in evidence and marked "Edison's Exhibit, Recording Telephone Sketch No. 1."

Exhibit objected to as irrelevant and immaterial and as not sufficiently proved.

Q. 48. Having reference to the larger of the two sketches which you have produced, is the writing thereon and the date in your handwriting or not?

A. That is in my handwriting.

Q. 49. What does the date indicate?

A. May 29th, 1902; I always signed the sketches, either the day I received them or the day following.

Q. 50. As I understand then, this sketch was in your possession at least as early as May 29th, 1902?

A. Yes, sir.

Q. 51. I will ask you to explain the parts of this sketch by reference to the letters in red ink which I have placed thereon?

A. This is the same machine that is illustrated in the sketch I have just produced. The mandrel *a* carries the phonograph blank on which a permanent record is to be made, *b* is the auxiliary cylinder with which engages the friction roller *c*; this friction roller drives the shaft *d*, on the end of which is mounted a worm *e*; the latter engages with a worm gear *f* on the shaft *g* and rotates the chalk cylinder *h*; *i* is the diaphragm to which is connected the electrode *j* bearing against the chalk roller *h*; the arm *k* offers a support for the shaft *g*; *l* is the usual phonograph arm which carries the recording and reproducing mechanism and which is fed longitudinally of the blank or record; as the recording mechanism feels longitudinally, the friction roller *c* will be fed longitudinally of the auxiliary cylinder *b*; *m* is the recording stylus which engages the blank so as to form a permanent record.

The larger sketch just referred to by witness is offered in evidence and marked "Edison's Exhibit Recording Telephone Sketch No. 2."

Exhibit objected to as irrelevant, immaterial and not sufficiently proved.

Q. 52. Can you produce any sketch of Mr. Edison's illustrating more in detail than the two sketches last referred to do, the connections between the motograph or chalk receiver and the phonograph recording mechanism?

A. Yes, here is one of Mr. Edison's sketches.

Q. 53. Is the date, May, 1902, on this sketch in your handwriting?

A. Yes, sir.

Q. 54. Does that date indicate when the sketch was received or dated by you?

A. Yes, it was dated by me in May, 1902.

Q. 55. I will ask you to kindly explain this sketch by reference to the letters that I have placed thereon in red ink?

A. Letter *a* indicates the body of the recorder carrying the diaphragm *b* and to which is pivoted the ordinary floating weight *c*; a small stylus lever *d* is mounted on the floating weight in the usual way and is connected by a link *e* to diaphragm *b*; at the forward end of the stylus lever *d* is the usual recording stylus *f* made of sapphire; mounted above the diaphragm *b* is a second diaphragm *g*, there being a space of about one-eighth of an inch between the two diaphragms. The fraction "1/8" on the sketch is in Mr. Edison's handwriting as a guide to me in spacing those diaphragms. Connected with the diaphragm *g* is an electrode spring *h* carrying a metallic button *i* near its upper end which bears on the chalk roller *j*; the chalk roller *j*, button *i*, electrode spring *h* and diaphragm *g* constitute an ordinary motograph or chalk receiver, the arrangement being such that vibrations communicated to the diaphragm *g* will be transmitted to the diaphragm *b* and thereby recorded on the blank.

Sketch last referred to by witness offered in evidence and marked "Edison's Exhibit, Recording Telephone Sketch No. 3."

Exhibit objected to as irrelevant, immaterial and not sufficiently proved.

Q. 56. Have you any book or other record from which you can ascertain definitely when the work was started on "Edison's Exhibit, Recording Telephone."

A. Yes, I find from my order book that the number of this job was 1283, and that work was started on the machine on May 29, 1902.

The order book referred to by the witness is offered to counsel for Macdonald for purposes of cross-examination.

Last answer objected to as incompetent.

Q. 57. In starting work on a machine of this sort what is the practice in the Laboratory regarding the number of the job; or, in the present case who gave this particular machine the job number 1283?

A. I did; we give every job a number so that the workmen working upon it will only have to carry a number on their time sheets, and oftentimes do not know what they are working upon, because it has only a number.

Q. 58. Please read on the record the entry in your order book relating to this particular order.

A. The entry is as follows: "1283. Recording telephone. May 29, 1902." This appears on page 12 of my order book.

Q. 59. Can you produce any notes from Mr. Edison relating to phonograph experiments in connection with the recording telephone?

A. Yes, sir; I produced two of Mr. Edison's notes on that subject.

Q. 60. Having reference to the shorter of these notes, in whose handwriting is it, exclusive of the date?

A. Mr. Edison's.

Q. 61. How long have you been familiar with Mr. Edison's handwriting?

A. Since 1869.

Q. 62. Have you ever seen him write?

A. Yes, sir.

Q. 63. In whose handwriting is the date on this note?

A. My handwriting.

Q. 64. And what does this date, May, 1902, indicate?

A. The month when I received the note.

Q. 65. What does Mr. Edison mean in this note by the expression "Motograph pens"?

A. The motograph pen is a little pen or metallic piece that bears on the chalk that is shown at "j" in "Edison's Exhibit, Recording Telephone Sketch No. 3."

The note in Mr. Edison's handwriting last referred to by the witness is offered in evidence and marked "Edison Exhibit Note No. 1."

Exhibit objected to as irrelevant and immaterial and not sufficiently proved.

Q. 66. In reference to the second of these notes, in whose handwriting is it?

A. It is in Mr. Edison's handwriting, except the date, which is my handwriting.

Q. 67. Does the date, May 1902, on this note indicate when you received it?

A. Yes, sir.

Q. 68. Can you state generally what this note refers to?

A. This refers to making different kinds of chalk cylinders or cylinders of different substances, for the motograph.

The note last referred to by the witness is offered in evidence and marked "Edison's Exhibit, Note No. 2."

Exhibit objected to as irrelevant and immaterial and as not sufficiently proved.

CROSS-EXAMINATION BY MR. MASSIE:

x-Q. 69. Is it not a fact that you cannot fix the date of these various exhibits except from the dates of the notes and memoranda that have been shown you, and your books?

A. As I have so many experiments on hand the year

Q. 65. What does Mr. Edison mean in this note by the expression "Motograph pens"?

A. The motograph pen is a little pen or metallic piece that bears on the chalk that is shown at "j" in "Edison's Exhibit, Recording Telephone Sketch No. 3."

The note in Mr. Edison's handwriting last referred to by the witness is offered in evidence and marked "Edison Exhibit Note No. 1."

Exhibit objected to as irrelevant and immaterial and not sufficiently proved.

Q. 66. In reference to the second of these notes, in whose handwriting is it?

A. It is in Mr. Edison's handwriting, except the date, which is my handwriting.

Q. 67. Does the date, May 1902, on this note indicate when you received it?

A. Yes, sir.

Q. 68. Can you state generally what this note refers to?

A. This refers to making different kinds of chalk cylinders or cylinders of different substances, for the motograph.

The note last referred to by the witness is offered in evidence and marked "Edison's Exhibit, Note No. 2."

Exhibit objected to as irrelevant and immaterial and as not sufficiently proved.

CROSS-EXAMINATION BY MR. MASSIE:

x-Q. 69. Is it not a fact that you cannot fix the date of these various exhibits except from the dates of the notes and memoranda that have been shown you, and your books?

A. As I have so many experiments on hand the year

round, it is utterly impossible to carry any one particular date in my mind for that length of time, so that I have to rely on sketches and note books.

x-Q. 70. Have you had anything to do with any experiments in the Edison Laboratory regarding any other recording telephone besides the one referred to in these sketches and in your testimony?

A. Not under that name, although the Edison Exhibit "First Transmitter" and "First Receiver," is a recording telephone.

x-Q. 71. Besides these particular exhibits introduced in this case, have you had anything to do with any other recording telephone in the Edison laboratory?

A. Not that I recollect.

x-Q. 72. I do not understand whether "Edison's Exhibit First Chalk Receiver" has one diaphragm or two?

A. It has one.

x-Q. 73. What is the purpose of the crank handle on this same exhibit?

A. For driving the two chinks; rotating the two chinks.

x-Q. 74. Does this exhibit show any device for the rotation of the chalk other than by hand?

A. No, sir; it does not.

x-Q. 75. When you were first asked about "Edison's Exhibit First Transmitter" and "Edison's Exhibit First Receiver," did you have some uncertainty as to which was the transmitter and which device was the receiver?

A. I have not very good eyesight and of course could not see without inspecting them thoroughly; I could not tell for the moment which was which.

x-Q. 76. Did you see Mr. Edison make the sketches "Edison's Exhibit Recording Telephone Sketch No. 1," "Edison's Exhibit Recording Telephone Sketch No. 2," and "Edison's Exhibit Recording Telephone Sketch No. 3?"

A. These sketches were not always made in my

presence, but were brought into my room by him, his room being the next adjoining room.

x-Q. 77. When did you see these sketches last before to-day?

A. I could not state when I did see them last.

Counsel for Macdonald renews the objections to the various exhibits and objects to this entire deposition as irrelevant and immaterial.

(The signature is waived).

John F. Randolph.

It is hereby stipulated and agreed between counsel that if John F. Randolph were regularly called and sworn as a witness on behalf of Thomas A. Edison he would testify as follows:

That he has been employed by Mr. Edison for more than 25 years past, during which time he had charge of the account books of the Edison Laboratory; that he has made extracts from the account books showing charges against experiment number 1283 and the same is herewith presented. That the items charged against this experiment commenced in May, 1902, and ended in December, 1902; that the total cost of the work amounted to \$462.17. That a charge for the first actual mechanical work was entered for week ending June 4, 1902, amounting to \$57.67; for the week ending June 11, 1902, \$54.25; for the week ending June 18, 1902, \$54.38; for the week ending June 25, 1902, \$71.18; for the week ending July 2, 1902, \$26; for the week ending July 9, 1902, \$11.67; and for the week ending July 30, 1902, \$4.05. That after July 30, 1902, no charges were entered on the book against this work until October, 1902, when the books showed that W. A.

Warren spent a week in experiments on this work at a charge of \$12 and that for the week ending December 13, 1902, Ludwig Ott spent ten hours on the work at a cost of \$1.50.

(The statement referred to in the above stipulated testimony is offered in evidence and marked "Edison's Exhibit, Book Extracts.")

That he has made extracts from the account books, showing charges against experiment No. 1148, referred to in the deposition of Ludwig F. Ott, and the same is herewith presented. That the items charged against this experiment commenced in July, 1901, and ended in September, 1901, and that the total cost of the work amounted to \$187.09; that the abbreviation "Std Phonos less reproducers" in said statement under date of August 29th, 1901, indicates two Standard phonographs, and that the abbreviation "deld 8/3" indicates the delivery of said phonographs by the Edison Phonograph Works to the Edison Laboratory on August 3, 1901.

(The statement last referred to is offered in evidence and marked "Edison's Exhibit Extracts—Experiment No. 1148.")

Counsel for Macdonald waives the production of the books themselves and admits the statements in lieu thereof but objects to the same as irrelevant and immaterial and as incompetent to prove anything in this interference.

Frank L. Dyer.

FRANK L. DYER, having been first duly sworn as a witness on behalf of Thomas A. Edison, deposes and says as follows:

I am attorney for Mr. Edison in this interference and have acted as his attorney in patent matters con-

tinuously since 1897. I find that upon referring to my personal diary, which I have kept continuously since 1899, that on May 9, 1902, I visited the Edison Laboratory and there witnessed an experiment by Mr. Edison in connection with recording telephones. The experiment was conducted in what is called the Galvanometer Room of the Laboratory, which is one of the outbuildings consisting of a long main room and two ante-rooms. Mr. Edison was seated at a table in one of the ante-rooms and had before him the machine introduced herein as "Edison's Exhibit, Second Chalk Receiver," which I recognized as an ordinary motograph. This receiver was connected with a transmitting instrument in the main room. A pair of ordinary phonograph listening tubes were connected with the receiver and upon turning the crank the message from the transmitting apparatus was received.

I do not recall so vividly the character of the transmitting instrument, but I am reasonably certain that the instrument used was the machine produced herein as "Edison's Exhibit, First Transmitter."

The deposition of the witness is objected to as irrelevant and immaterial, and counsel for Macdonald particularly objects to the term "ordinary motograph" as misleading and without any understanding in the art.

No cross-examination.

(Signature waived.)

In view of imperative engagements of counsel for both parties, and of Mr. Edison, it is stipulated and agreed that Edison's time for closing his *prima facie* proofs be extended to September 15, 1906, other times to be extended accordingly.

Adjourned subject to notice.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON

vs.

THOMAS H. MACDONALD.

Interference
No. 25,677.EDISON LABORATORY, ORANGE, N. J.,
Tuesday, September 25, 1906.

Met pursuant to agreement.

Present—

FRANK L. DYER, ESQ., for Thomas A. Edison.

C. A. L. MASSIE, ESQ., for Thomas H. Macdonald.

Thomas A. Edison.

THOMAS A. EDISON being produced on his own behalf and first duly sworn, and asked questions by Mr. Dyer, deposes as follows:

Q. 1. State your name, age, residence and occupation?

A. My name is Thomas A. Edison; I am fifty-nine years of age and reside at Llewellyn Park, Orange, N. J.; by occupation I am an inventor.

Q. 2. I call your attention to a piece of experimental apparatus and ask you if you ever saw it before?

A. Yes.

Q. 3. What is it?

A. This instrument is a phonograph equipped with a reproducer and connected to the producer is a telephone, whereby sounds from the phonograph are transmitted to the telephone over the wire.

Q. 4. What was the purpose of this apparatus?

A. It is one of the parts of a system of recording telephonic speech and sounds.

The apparatus referred to by the witness is
"Edison's Exhibit, First Transmitter."

Q. 5. I call your attention to another piece of experimental apparatus and ask you if you can identify the same?

A. Yes, it is another part of the same scheme.

Q. 6. What was this apparatus used for?

A. For transmitting the recorded speech over a telephone. This apparatus is the recording part, for recording the telephonic signals on the phonograph.

The apparatus last referred to by the witness
is "Edison's Exhibit, First Receiver."

Q. 7. What commercial use, if any, did you expect to make of this apparatus?

A. The endeavor to produce a recording telephone arose from the desire on the part of some of the railroad telegraph superintendents to have a system whereby they could change over from the telegraph to the telephone, but they did not want to change unless they had some means of recording all of the conversation on the wire and it was from talking with these superintendents at one of their conventions that I undertook to try to solve the problem.

Q. 8. How long have you had in mind the combination of a telephone with a phonograph so as to make a permanent record of a telephonic message?

A. A great many years, ever since the invention of the phonograph.

Q. 9. Who experimented as you now remember with the two pieces of apparatus "Edison's Exhibit, First Receiver" and "Edison's Exhibit, First Transmitter"?

A. Myself and Mr. Ott, I believe.

Q. 10. I call your attention to another piece of apparatus and ask you if you know what it is ?

A. It is what is known as the electro-motograph, applied to a telephone, whereby the telephone is actuated by impulses of electricity acting upon a porous cylinder in a manner now, as yet, unknown.

Q. 11. When did you invent the electro-motograph ?

A. 1873.

Q. 12. What was the object of this apparatus ?

A. The only practical application ever made of this discovery was its connection with the receiving telephone for the purpose of amplifying sound. It was called the loud speaking telephone, but never came into practical use on account of the fact that it was too uncertain, its mode of action being not understood.

Q. 13. Is this apparatus also known as the chalk receiver ?

A. Yes, it has been called that.

Q. 14. Was the moto-graph or chalk receiver patented by you ?

A. Yes, sir, some time prior to 1880.

Q. 15. What were the difficulties encountered in connection with the chalk receiver or moto-graph to which you have referred ?

A. Uncertainty. Up to the present time I have been unable to produce a dozen cylinders which would give the same results, probably due to the fact that the cause of the movement produced by the electric wave is unknown.

The apparatus last referred to by the witness is "Edison's Exhibit, First Chalk Receiver."

Q. 16. I call your attention to another piece of apparatus and ask if you can identify it ?

A. It is a chalk receiver for a telephone, one I used in 1902 for testing a great many different kinds of chalk and other finely divided material, compressed in cyl-

inders, to see if I could not get something having some degree of constancy.

Q. 17. Do you recall when this apparatus was made?

A. Some time in 1902; it might have been a little earlier, but I think around about that time.

(The apparatus last referred to by the witness is "Edison's Exhibit, Second Chalk Receiver.")

Q. 18. I show you a note ("Edison's Exhibit, Note No. 1"), and ask you if you can identify the same?

A. This note was written by me.

Q. 19. What does it relate to?

A. It relates to this experiment of the recording telephone.

Q. 20. What was the purpose of the experiments referred to in the note?

A. These were the pressure foots or electrodes through which the current passed into the chalk cylinder.

Q. 21. Why did you suggest the use of several different kinds of electrodes?

A. I wanted to see whether the nature of the metal or substance in contact with the chalk had any influence upon the result.

Q. 22. I show you another sketch ("Edison Exhibit Note No. 2"), and ask you if you can identify the same?

A. Yes, this is my handwriting.

Q. 23. What was the purpose of the experiments recorded on this note?

A. To study this phenomena with a view to finding out the cause of the phenomena.

Q. 24. Do you recall what was done with these two notes or to whom they were handed?

A. To John Ott, the experimental superintendent, and I believe most of them were made.

Q. 25. I show you another sketch ("Edison's Ex-

hibit, Sketch of Chalk Receivers ") and ask you if you can identify it ?

A. Yes, this is one of the sketches, showing one or two varieties of hand revolving chalk telephones for use in these experiments.

Q. 26. What relation, if any, was there between this sketch and the two model exhibits " Edison's Exhibit, First Chalk Receiver " and " Edison's Exhibit, Second Chalk Receiver " ?

A. I think those were rough indications of what I wanted, as shown in the two model exhibits.

Q. 27. I show you a sketch (" Edison's Exhibit, Recording Telephone Sketch No. 1 ") and ask you if you can identify it ?

A. Yes ; this is a sketch by myself.

Q. 28. What does it represent ?

A. It is probably some sketch made in explaining to John Ott how to construct the final device which I was going to put on the recording telephone.

Q. 29. I show you another sketch (" Edison's Exhibit, Recording Telephone Sketch No. 2 "), and ask if you can identify it ?

A. That was another sketch explanatory of how to construct the final instrument.

Q. 30. With regard to this sketch No. 2, are you able to describe the apparatus which you expected to make by reference to the red letters appearing on the sketch ?

A. *h* is the chalk cylinder ; *m* the recording point ; *i* the body holding the diaphragm ; *g* is the shaft which gives rotation to the chalk ; *f* is the worm gear ; *d* the worm arm, and *c* a wheel which runs on the cylinder connected with the phonograph mandrel ; the rotation of the cylinder *b* gives motion sufficient to turn the chalk cylinder very slowly and at the same time the wax cylinder upon the larger part of the drum in rotating ; *j* is what we call the pen or the electrode leading the current into the chalk.

Q. 31. I show you another sketch (" Edison's Ex-

hibit, Recording Telephone, Sketch No. 3"), and ask you if you can identify it?

A. This is a part of the apparatus, *j* being the chalk, *i* the pen or electrode which is connected to the two diaphragms *g* and *b*; *f* is the recording mechanism.

Q. 32. Did you make this last sketch?

A. Yes, sir.

Q. 33. Did you ever build an apparatus in accordance with recording telephone sketches, Nos. 1, 2 and 3?

A. Yes.

Q. 34. What was done with these three sketches?

A. I gave them to John Ott.

Q. 35. What did he do?

A. He constructed the machine.

Q. 36. I call your attention to a piece of apparatus before you and ask you if you can identify it?

A. Yes, sir; that is the complete machine, the recording telephone.

(Witness refers to "Edison's Exhibit Recording Telephone.")

Q. 37. That machine then was constructed after the three sketches?

A. Yes, sir.

Q. 38. Do you remember when this machine was built?

A. 1902.

Q. 39. What, if anything, was done with the machine after it was finished?

A. Just tested to see whether the mechanism was all right.

Q. 40. What kind of a test did you make of it?

A. Just ran it back and forward.

Q. 41. Did you find that it operated satisfactorily?

A. Yes; it operated all right.

Q. 42. What then was done with it?

A. It was set aside.

Q. 43. For what purpose was it set aside?

A. So that I could continue the experiments with the chalk to produce a commercial application of the motograph principle to the apparatus.

Q. 44. Your application for a patent on this apparatus was not filed until September 15, 1905; why did you wait so long before applying for a patent after completing the machine?

A. Because I thought I had applied for a patent. I remember writing out the specifications, and I believe I sent them to New York, but somehow, by change of patent lawyers and such, I found it was never filed.

Q. 45. What change, if any, did you make in your patent lawyers?

A. I made change from the firm of Dyer & Dyer to Mr. Frank L. Dyer, who came to the laboratory and opened an office in April, 1903.

Q. 46. When I called your attention to the fact that an application had not been filed on this machine what was done?

A. I insisted that it was, and I believe a search was made over in New York to find out.

Q. 47. Was the application then filed?

A. It was then immediately filed, when no record could be found of the previous filing.

Q. 48. With reference to the exhibit "Recording Telephone," after it was constructed and operated as you have said, why was not the invention pushed commercially?

A. Because one of the necessary parts of the telephone, to wit, the chalk, could not be got to give even results sufficient to make it a commercial success on a railroad telephone line and it was necessary to go into a great deal of experimenting to produce a reliable chalk and such experiments have been continued for many years and are still being made now. If the cause of this phenomena could be ascertained there would probably be no trouble in producing a reliable chalk

cylinder, but so far I have been unable to find out the cause or to produce an even result.

Q. 49. That is to say, as I understand it, some of the chalk cylinders work satisfactorily and others do not ?

A. Yes, although made exactly the same as far as we know.

Q. 50. When was this machine operated ; as soon as it was built or later ?

A. As soon as it was built.

CROSS-EXAMINATION BY MR. MASSIE :

x-Q. 51. How do you identify these two exhibits, " Edison's Exhibit, First Transmitter " and " Edison's Exhibit, First Receiver " ?

A. By seeing them around the laboratory and knowing of their construction.

x-Q. 52. The same answer will apply to the other physical exhibits ; you identify them in the same way ?

A. I identify them by knowing of their construction and operation, and long experimentation.

x-Q. 53. Mr. Frank L. Dyer, your present attorney was a member of the firm of Dyer & Dyer, your former attorneys ?

A. Yes, sir.

(Signature and certificate waived.)

Frederick P. Ott.

FREDERICK P. OTT, a witness produced on behalf of Thomas A. Edison, being first duly sworn and asked questions by Mr. Dyer, testified as follows :

Q. 1. State your name, age, residence and occupation ?

A. My name is Frederick P. Ott, I am forty-six

years old, and reside at 54 Valley Road, West Orange, N. J. My occupation is experimenting.

Q. 2. You are employed by Mr. Edison, are you not?

A. Yes, sir.

Q. 3. How long have you been connected with Mr. Edison?

A. About twenty-three years.

Q. 4. What are your duties, generally speaking?

A. To assist him in any work he may take up or in any of his experiments.

Q. 5. Did you assist Mr. Edison in connection with experiments on recording telephones?

A. I did.

Q. 6. I call your attention to a piece of apparatus ("Edison's Exhibit First Receiver") and ask you if you ever saw it before?

A. Yes.

Q. 7. What was the purpose of this apparatus?

A. For telegraph work to take the place of the telegraph for messages; signals.

Q. 8. What was this particular piece of apparatus for?

A. That was for doing the recording; that one; the recording of telephone messages.

Q. 9. On what are the records made?

A. On a wax record like an ordinary phonograph.

Q. 10. I call your attention to a second piece of apparatus ("Edison's Exhibit, First Transmitter") and ask you if you ever saw it before?

A. Yes.

Q. 11. What is that apparatus?

A. That is the transmitter that sends the message.

Q. 12. What was the purpose of his transmitter?

A. We put a phonograph record on the mandrel and the record operated the telephone transmitter so as to send a message over the line.

Q. 13. Did you ever operate these two pieces of apparatus together?

A. I never operated them together, but I operated the transmitter.

Q. 14. How did you operate this transmitter alone?

A. In connection with the chalk receiver.

Q. 15. Do you remember when these two pieces of apparatus were built?

A. I cannot recall the exact date, but it was a long time ago.

Q. 16. Do you recall ever seeing Ludwig Ott ever experimenting with this apparatus?

A. Yes, he helped us out on it.

Q. 17. Was Ludwig Ott any relation of yours?

A. Yes, he is my nephew.

Q. 18. I call your attention to another piece of apparatus ("Edison's Exhibit, First Chalk Receiver") and ask you if you ever saw that before?

A. Yes.

Q. 19. What is it?

A. The same as the other one, only we put two rollers on it. We never operated that, because we were working at that time on the chalk rollers to get better results; they were stuck on the chalk; they did not stand up as they should.

Q. 20. When you speak of "the other one" which apparatus do you mean?

A. That one (referring to "Edison's Exhibit, Second Chalk Receiver").

Q. 21. Did you operate the second chalk receiver?

A. Yes, sir.

Q. 22. This is a piece of apparatus, as I understand it, that you operated in connection with "Edison's Exhibit, First Transmitter"?

A. Yes, sir.

Q. 23. What is this apparatus known as?

A. The loud-speaking telephone.

Q. 24. Were you familiar with the loud-speaking telephone before these experiments?

A. Yes, sir.

Q. 25. Was it one of Mr. Edison's well-known inventions?

A. Yes, sir.

Q. 26. Do you recall whether it is sometimes referred to as the motograph?

A. Yes, sir; it is sometimes referred to as the motograph and also as the chalk receiver.

Q. 27. Do you remember when these two chalk receivers were made? I have reference to "Edison's Exhibit, First Chalk Receiver" and "Edison's Exhibit, Second Chalk Receiver."

A. Somewhere around 1902.

Q. 28. Were they constructed before or after "Edison's Exhibit, First Receiver" and "Edison's Exhibit, First Transmitter"?

A. That was made first (pointing to "Edison's Exhibit, Second Chalk Receiver").

Q. 29. This chalk receiver was made before the exhibits "First Transmitter" and "First Receiver"?

A. Yes, sir.

Q. 30. What is the purpose of a chalk receiver or motograph; to modify or amplify the sounds?

A. To amplify the sounds.

Q. 31. To what extent would the sounds be amplified?

A. Oh, a great deal louder than the ordinary telephone.

Q. 32. I show you a note (Edison's Exhibit, Sketch of Chalk Receivers), and ask you if you ever saw it before?

A. Yes, sir, I did.

Q. 33. Do you recognize the handwriting?

A. I do.

Q. 34. Whose handwriting is it?

A. Mr. Edison's.

Q. 35. Do you know when this sketch was made?

A. It was made in 1902.

Q. 36. Do you know the purpose of this sketch; why was this sketch made?

A. In connection with the telegraph message ; and also to instruct John Ott in reference to the construction of it.

Last answer objected to as incompetent.

Q. 37. I show you another note ("Edison's Exhibit Note No. 1") and ask you if you ever saw it before?

A. Yes.

Q. 38. In whose handwriting is that?

A. Mr. Edison's.

Q. 39. Do you know what it relates to?

A. It relates to the same thing; he used these different metals for pens for the motograph.

Q. 40. I show you another note ("Edison's Exhibit Note No. 2") and ask you if you ever saw that note before?

A. Yes, sir, I did.

Q. 41. Whose handwriting is that?

A. That is Mr. Edison's.

Q. 42. What does this note relate to?

A. It relates to different compounds for chalk rollers.

Q. 43. Did you make experiments in the chalk rollers?

A. Yes, sir.

Q. 44. How many experiments did you make?

A. Oh, we must have made four or five hundred of them with different compounds.

Q. 45. What was the purpose of these experiments?

A. To get a chalk which would be more suitable than the present one.

Q. 46. Are you still working on experiments in chalk?

A. Yes, sir, off and on.

Q. 47. Have you yet succeeded in finding a perfectly uniform material?

A. Not yet, no.

Q. 48. Do I understand from you that in the case of

chalk for the chalk telephone, all chalks are ineffective or only some chalks?

A. Most of them are ineffective.

Q. 49. What about the others.

A. Some of them are fair, but they do not seem to be constant; they do not stand up.

Q. 50. That is, with the same material you get different results.

A. Yes.

Q. 51. I show you a sketch ("Edison's Exhibit, Recording Telephone Sketch No. 1") and ask you if you ever saw that before?

A. Yes.

Q. 52. Who made this sketch?

A. Mr. Edison.

Q. 53. Do you know when it was that you first saw it?

A. When I first saw it was down in John Ott's room in 1902.

Q. 54. Do you know why John Ott had this sketch?

A. To build the machine from.

Q. 55. Can you describe the machine which the sketch is designed to represent from the letters of reference on it?

A. Yes.

Q. 56. Will you do so?

A. That is the machine over there (indicating).

Q. 57. But can you refer to the letters and say what they represent?

A. *a* is the cylinder and *b* is the drum to rotate the chalk roller; *c* is the roller.

Q. 58. The chalk roller?

A. No, the rubber roller, rotated by the drum; and *d* is the worm shaft which is operated by the small friction wheel, and *e* is the small wheel that is turned by the worm; *f* is the shaft turned by the worm wheel, *g* is the chalk roller and *h* is the pen or electrode; *i* is the diaphragm connected to the pen.

Q. 59. I show you a sketch ("Edison's Exhibit, Re-

ording Telephone Sketch No. 2") and ask you if you ever saw that before?

A. Yes, sir.

Q. 60. Do you know who made the sketch?

A. Mr. Edison.

Q. 61. When did you first see this?

A. In 1902, in John Ott's room.

Q. 62. What was the purpose of this sketch?

A. The same as the other.

Q. 63. Can you describe the machine that this sketch is designed to illustrate?

A. *a* is the drum or mandrel carrying the blank cylinder; *b* is the drum rotating with the mandrel driving the rubber wheel *c* which drives the shaft *d* and then it drives the worm *e* and the worm wheel *f*, which rotates the shaft *g* carrying the chalk roller *h*; *i* is the diaphragm connected by the electrode *j* which bears on the chalk roller; *k* is the arm supporting the shaft *g*, and *m* is the recorder which makes the record in the wax.

Q. 64. I show you a third sketch ("Edison's Exhibit, Recording Telephone Sketch No. 3") and ask you if you ever saw that before?

A. Yes, sir.

Q. 65. When did you see it and where?

A. In John Ott's room in 1902.

Q. 66. Who made this sketch?

A. Mr. Edison.

Q. 67. Can you describe the device illustrated by this sketch?

A. *a* is the frame of the recorder, *b* is the lower diaphragm, *c* is the floating weight, *d* is the small lever connected to the lower diaphragm by the link *e* and carrying the recorder stylus *f* at the other end; *g* is the upper diaphragm which vibrates the lower diaphragm by the air cushion between them. The upper diaphragm is connected with the electrode or pen *h* which carries the little button *i* bearing on the chalk roller *j*.

Q. 68. Do you remember whether a machine was built to exemplify the device illustrated by these three sketches to which you have just testified?

A. Yes.

Q. 69. Will you please point out the machine, if you find it present?

A. There it is over there. (Witness refers to "Edison's Exhibit, Recording Telephone.")

Q. 70. Did you witness the construction of this machine?

A. Yes, sir; I did.

Q. 71. Where was this machine built?

A. In the Laboratory on the second floor.

Q. 72. What were you doing at the time?

A. Working on the chalk rollers.

Q. 73. How often did you have occasion to witness the construction of this machine?

A. Oh, I would go in there once a day to see its progress.

Q. 74. How long was the machine under construction?

A. Oh, we worked on it for a month, I guess.

Q. 75. Is the machine new throughout or simply an old phonograph remodeled?

A. It is an old phonograph remodeled.

Q. 76. Do you recall who worked on the machine?

A. No, nothing more than it was being built under the supervision of Mr. John Ott.

Q. 77. Do you recall whether this machine was built during the time or after the experiments were made in transmitting messages from the apparatus "Edison's Exhibit, First Transmitter" to the receiver, "Edison's Exhibit, First Receiver"?

A. After the chalk receiver was built work was commenced on the recording telephone.

Q. 78. After Edison's Exhibit Recording Telephone was constructed, what was done with it?

A. Turned over to me and we took it down to the

Galvanometer Room and ran it and tested it, and as far as the machine went it was all right.

Q. 79. How did you operate this machine, by hand or by the electric motor in it?

A. By the electric motor in it.

Q. 80. How long did you operate it?

A. We ran it for about fifteen or twenty minutes to see everything ran all right.

Q. 81. How did it work?

A. Everything worked all right.

Q. 82. Did you operate it long enough to cause the carriage to travel one or more times across the mandrel?

A. Oh, yes, sir.

Q. 83. Did you find during this operation that the chalk wheel was turned properly?

A. Yes, sir.

Q. 84. The record books of the laboratory (Edison's Exhibit Book Extracts) show that you were employed in connection with experiment number 1283 entitled "Recording Telephone" from June 4, 1902, until June 30, 1902. Are you able to state whether the machine "Edison's Exhibit, Recording Telephone" was constructed during that period?

A. It was.

Q. 85. That is to say during the time you were working on the chalk-rollers this machine (Edison's Exhibit, Recording Telephone) was built and finished?

A. Yes, sir.

Q. 86. Was it operated during this time or afterwards?

A. It was operated during the time we were working on the chalk rollers?

Q. 87. Since the construction of this machine have you been able to give your time continuously to experiments on the chalk rollers?

A. Not continuously, no.

Q. 88. What have you been working on principally?

A. The storage battery, lately.

Q. 89. How many experiments have you and Mr. Edison made on storage batteries during the past four years?

A. It would be close to 5,000 or something in that neighborhood; our record books would show it.

CROSS-EXAMINATION BY MR. MASSIE:

x-Q. 90. How do you know that the sketch of recording telephone "No. 1" was made by Mr. Edison?

A. Because I know his sketches and am familiar with his handwriting; I could tell his sketches out of a thousand.

x-Q. 91. I would ask the same question about Edison's Exhibit, Recording Telephone, sketches No. 2 and No. 3; how do you know they were made by Mr. Edison?

A. I have handled so many of them and am so familiar with them that I know his sketches the moment I see them and I could tell whether it was made by him or not.

x-Q. 92. Do you notice any handwriting of Mr. Edison's on either of these two sketches?

A. No, not on them.

x-Q. 93. How do you know that these sketches were made in 1902?

A. Because we were working on that at the time and I was in my brother's room working on the chalk rollers and getting information in there when these sketches were handed to him.

x-Q. 94. How do you fix the date as being 1902?

A. Because I was working on that (indicating "Edison's Exhibit, Second Chalk Receiver") at the same time.

x-Q. 95. How do you know it was in 1902 that you were working on "Edison's Exhibit, Second Chalk Receiver?"

A. Because we had them connected together, work-

ing them ; as fast as we could make the chalks we would put them in and test them.

x-Q. 96. The question is : " How do you know it was in 1902 that you were working on that thing ? "

A. By making the rollers, chalk rollers, for it ; I was pressing the chalk put in the mold, molding the chalk.

x-Q. 97. How do you know that it was in the year 1902 that you were molding the chalk ; as I understand your testimony you fix the date of the sketches because at that time you were working on the apparatus and you fix the date of the apparatus because at that time you were molding the chalk ; but how do you know that all of this was in 1902 ?

A. By the time I worked on it.

x-Q. 98. When you operated or tested " Edison's Exhibit, Recording Telephone," was there a sound record on the mandrel ?

A. No.

x-Q. 99. Have you ever worked upon or do you know anything of any other recording telephone that Mr. Edison has produced except this particular exhibit ?

A. No, I cannot say that I do.

RE-DIRECT EXAMINATION :

Re-d. Q. 100. Did you ever see Mr. Edison make pencil sketches ?

A. Yes, sir.

Re-d. Q. 101. Do you entertain any doubt at all that the three sketches, Edison's Exhibit, Recording Telephone Sketches 1, 2 and 3, respectively, were made by him ?

A. They were made by him and I will vouch for it. We used to work twenty-one hours out of twenty-four making sketches and making things and I ought to be pretty familiar with them, I think.

Signature and certificate waived.

Counsel for Edison in order to show the public knowledge of the construction and operation of the motograph or chalk receiver offers in evidence a copy of Edison's patent number 221,957 dated November 25, 1879, and the same is marked "Edison's Exhibit, Chalk Receiver Patent."

Counsel for Macdonald objects to the exhibits as incompetent for the purposes stated, and as irrelevant and immaterial.

William A. Warren.

WILLIAM A. WARREN, a witness produced on behalf of Thomas A. Edison, having been first duly sworn, in answer to questions propounded by Mr. Dyer, testified as follows :

Q. 1. Please give your name, age, residence and occupation.

A. My age is twenty-six ; I reside at 2 University Place, Orange, N. J. ; and my occupation is that of a manufacturer of electrical measuring instruments.

Q. 2. Are you familiar with mechanical and electrical subjects ?

A. Yes.

Q. 3. State briefly what your education was in these subjects ?

A. I spent four years in Columbia University from the fall of 1898 to the spring of 1902 in the electrical engineering course and during that time experimented, outside of the course, on various schemes of my own, both mechanical and electrical. In the spring of 1902, I was employed by Mr. Edison as an experimenter and on electric furnace work and later on on automobile work and then went to the Edison Portland Cement Company as electrical engineer and was there for two.

months, and until about September 1st, when I returned to the laboratory.

Q. 4. What were your duties at the works of the Edison Portland Cement Company?

A. Electrical engineer, devising new schemes for the application of electricity at the works.

Q. 5. You say you came back to the laboratory about the 1st of September, 1902. How long did you remain there?

A. Until sometime the next spring.

Q. 6. What did you then do?

A. I went back to the Edison Portland Cement works as consulting engineer.

Q. 7. When you came back to the laboratory about the first of September, 1902, did you have occasion to make any experiments on recording telephones?

A. Yes, I worked at trying to produce a more sensitive transmitter than was on the market at that time, trying to make an improved transmitter.

Q. 8. How long did you continue on that work?

A. On that and other work that I carried on at the same time, for about two months.

Q. 9. I call your attention to a piece of apparatus ("Edison's Exhibit, Recording Telephone") and ask if you ever saw this machine?

A. I did, yes; Mr. Edison had that machine built during either September or October, 1902, at least then is when I first saw it.

Q. 10. Was that machine completed at that time?

A. Yes, sir.

Q. 11. In the same form as it is now?

A. Yes, sir.

Q. 12. Did you ever see the machine operated?

A. No.

Q. 13. Did you ever examine this machine from the standpoint of an electrical engineer?

A. Yes, sir.

Q. 14. Is this machine in your opinion an operative machine?

A. Yes, sir.

Q. 15. Are you familiar with the construction and operation of the chalk receiver?

A. Yes, sir.

Q. 16. Have you ever operated the chalk receiver?

A. Yes.

Q. 17. If the machine before us is of such mechanical construction that on the turning of the mandrel the chalk receiver will slowly rotate, do you entertain any doubt if vibrations corresponding to sound waves are received at the electrode of the chalk receiver, the vibration set up and communicated thus to the recording stylus would be recorded on the phonograph blank?

Question objected to as without sufficient foundation.

A. No, there could be no doubt about it.

CROSS-EXAMINATION BY MR. MASSIE :

x-Q. 18. Is it your understanding that the exhibit concerning which you have testified, "Edison's Exhibit, Recording Telephone," is at present in such condition that if connected with telephone wires in circuit and having a blank cylinder on the mandrel, you could thereby record a record on that cylinder?

A. (Witness examines the machine carefully). Yes.

Signature and certificate waived.

Adjourned until a day to be agreed upon.

ORANGE, N. J., October 1, 1906.

Met pursuant to agreement.

Present—Counsel as before.

Frank L. Dyer.

FRANK L. DYER, having already been duly sworn as a witness on behalf of Mr. Edison, testifies as follows:

I have already testified as a witness in this case, but I wish at this time to corroborate a statement made by Mr. Edison in his deposition. Shortly before the Edison application was filed, and certainly not earlier than September 1, 1905, I observed in the Galvanometer Room of the Edison Laboratory, the piece of apparatus which has been introduced herein as "Edison's Exhibit, Recording Telephone." In the Galvanometer Room were a large number of experimental and commercial apparatus, representing part of Mr. Edison's work as an inventor. The exhibit in question was then in the same condition as it is now, and so far as I could see, it appeared to be completely finished and a perfect piece of apparatus. I called Mr. Edison's attention to the exhibit and asked him what it was, and he informed me that it was a recording telephone for the purpose of recording telephone messages on a phonograph and that the invention was to be used in connection with railroad signaling. I asked him why he had not filed an application for a patent on the device and replied that he had. I informed him that no application has been filed to my knowledge, nor had I ever heard of the apparatus before, but he insisted that he was right, and that the records in my office in New York would disclose the fact. I thereupon had a search made through the records of my New York firm, Messrs. Dyer & Dyer, 31 Nassau street, but nothing was found to substantiate Mr. Edison's belief. Mr. Edison explains his failure to file the application to the possible fact that in changing

his attorneys, the matter may have been overlooked. I came to the Laboratory to take charge of Mr. Edison's work on April 1, 1903. For some months prior to that time Mr. Edison had repeatedly urged me to take charge of his work personally, as he was dissatisfied with having the work done in New York, and I finally consented to do so.

The deposition of the witness is objected to as irrelevant and immaterial.

No cross-examination.

Signature and certificate waived.

STATE OF NEW JERSEY, }
County of Essex, } ss. :

I, HERBERT W. KNIGHT, a Master and Examiner in Chancery in and for the State of New Jersey, and Special Examiner by consent herein, do hereby certify that the foregoing depositions of Ludwig F. Ott, John F. Ott, Frank L. Dyer (2), Thomas A. Edison, Fred'k P. Ott and William A. Warren, were taken on behalf of Thomas A. Edison in pursuance of the notice hereto annexed before me at the Edison Laboratory, West Orange, New Jersey, on the 24th day of July, 1906; on the 25th day of September, 1906, and on the 1st day of October, 1906; that each of said witnesses was by me duly sworn before the commencement of his testimony; that the testimony of each of said witnesses was taken stenographically by me by consent of counsel for both parties and was then transcribed by me on the typewriter, and that the opposing party was represented by C. A. L. Massie, Esq.; that said testimony was taken at West Orange, New Jersey, and was commenced at 10:30 A. M. on the 24th day of July, 1906; was continued on the 25th day of September, 1906, and was concluded on the 1st day of October, 1906; that I am not connected by blood or marriage with either of said parties, nor interested directly or indirectly in the matter in controversy.

IN TESTIMONY WHEREOF I have hereunto set my hand at Newark, New Jersey, this eighth day of October, 1906.

HERBERT W. KNIGHT,
Master and Examiner in Chancery.

Edison's Exhibit Book Extracts.

RECORDING TELEPHONE.

S. O. No. 1283

May 1902

Invoice Merck and Co.—May 6,
1902

3 Ozs Bismuth hydrate pure.....	.17 oz	.51
1 Bottle		.06
3 Ozs Bismuth Oxalate.....	.25 oz	.75
1 Bottle.....		.06
$\frac{1}{2}$ lb Bismuth Sub carbonate.....	1.70 lb	.85
1 Bottle		.07
$\frac{1}{2}$ lb Bismuth Oxychloride.....	1.70 lb	.85
1 Bottle.....		.07
1 lb Calcium carbonate precip 1 carton inc.....		.09
$\frac{1}{2}$ lb Calcium Oxalate.....	1.75 lb	.88
1 Bottle.....		.07
1 Oz Cerium carbonate.....		.45
1 Vial.....		.04
3 Ozs Cerium oxalate pure (1 car- ton inc.)	.04 oz	.12
3 lbs Magnesium carbonate powd.	.15 lb	.45
1 ppr inc.....		
3 Ozs. Magnesium fluoride.....	.30 oz	.90
1 Bottle.....		.06
1 lb. Zinc Carbonate precip.....		.18
1 Bottle.....		.12
$\frac{1}{2}$ lb Zinc Oxalate.....	.75 lb	.37
1 Bottle.....		.07
$\frac{1}{2}$ lb Aluminum hydrate pure.....	.50	.25
1 Bottle.....		.07
1 lb Aluminum hydrate dried com'l		.20
1 Bottle.....		.10
$\frac{1}{2}$ lb Animal charcoal purif. moist.	.30 lb	.15
1 Bottle		.07
2 Ozs Sodium uranate.....	.30 oz	.60
1 Bottle.....		.05
$\frac{1}{2}$ lb Barium Oxalate pure.....	.20 lb	.10
1 Bottle.....		.07
2 lb. Barium Sulphide pure powd.	.45 lb	.90
1 bottle.....		.10
1 lb Mercury chloride subl.	1.25 lb	.63
1 Bottle.....		.05

Raymond R. Wile
Research Library

		<i>Invoice United States Express Co.</i>	
June 10	Express on soap from Gaunt & Janvier.....	.25	
			.25
		<i>Pay Roll week ending June 4, 1902</i>	
	F. P. Ott one week	35.00	
	John F. Ott 4 days.....	16.67	
	Arthur Estler 20 hours at 30.....	6.00	
			57.67
		<i>Pay Roll week ending June 11-1902</i>	
	F. P. Ott one week	35.00	
	J. F. Ott 1 day.....	4.17	
	Eugene Fuchsburger 2 hours 22½c..	.45	
	Arthur Estler 45 " 32½c..	14.63	
			54.25
		<i>Pay Roll week ending June 18-1902</i>	
	F. P. Ott one week	35.00	
	J. J. Richter 4 hours at .30.....	1.20	
	A. S. Barnes 1 " " .30.....	.30	
	Arthur Estler 55 " " .32½.....	17.88	
			54.38
		<i>Pay Roll week ending June 25-1902</i>	
	F. P. Ott one week	35.00	
	J. J. Richter 61 hours at .30.....	18.30	
	Arthur Estler 55 " " .32½.....	17.88	
			71.18
			237.48
July 1902			
		<i>Invoice Edison Phonograph Works</i>	
"	Silver Plate 37 small pieces. Labor and Material.....	.25	
	½ lb. .025 Sheet Brass .19.....	.10	
			.35
			.35
		<i>Pay Roll week ending July 2, 1902</i>	
	J. J. Richter 39 hours—.30.....	11.70	
	Arthur Estler 44 " .32½.....	14.30	
			26.00
		<i>Pay Roll week ending July 9-1902</i>	
	F. P. Ott 2 days 5.83½	11.67	
		<i>Pay Roll week ending July 23, 1902</i>	
	Louis Ott 5 hours .15.....	.75	
		<i>Pay Roll week ending July 30-1902</i>	
	Louis F. Ott 27 hours .15 (Time sheet dated June 25-1902.....	4.05	
			42.47

October 1902

Pay Roll week ending Oct. 8, 1902

W. A. Warren 1 week.....	12.00	
		12.00

December 1902

Louis F. Ott week ending Dec. 17,

02-10 hrs	15	1.50
		1.50

General Expenses.....		146.73
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		<u>\$462.17</u>
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**Edison's Exhibit Extracts Experiment
No. 1148.**

**RAILWAY TELEPHONE EXPERIMENT FOR BLOCK
SIGNALS.**

S. O. No. 1148.

July 1901

J. F. Ott, July 29, 1901—1 Day..... \$4.16

Louis F. Ott

July 27—5 hours July 29—5 hours—

Total hrs. 15	1.50
---------------------	------

5.66

August 1901

Invoice Edison Mfg. Co.

" 28 8 Z. Cells Complete \$16.00 Less 40%.....	9.60
--	------

*Invoice Edison Phonograph**Works*

Aug. 13 12 ft No. 18 Cord .04½c. Yd.....	.18
--	-----

" 29 2 Std. Phonos. less reproducers	
--------------------------------------	--

4.60) Deld	9.20
------------------	------

2 Excelsior Slot Cabinets 4.10)	
---------------------------------	--

8/3	8.20
-----------	------

17.58

*Invoices Manhattan Electrical
Supply Co.*

" 16 2 No. 18 Desk Telephones for Magnet 6.00	12.00
--	-------

2 Fuller Standard Teld battys	
-------------------------------	--

Comp. .75.....	1.50
----------------	------

5 Ft. No. 3 Cind Cord .12—40%.	.36
--------------------------------	-----

2-80 ohms Magneto Extension	
-----------------------------	--

Bells 1.25	2.50
------------------	------

Aug. 20	2-2 ft Telephone Cord .11.....	.22	
	2-50 ohm Induc. Coils .50.....	1.00	
	2-150 " " " .25.....	.50	
	2 lbs Elec Sand " .16.....	.32	
	2 1000 Ohm No. 1 Signal Bell 3.00	6.00	
		<u>24.40</u>	
	<i>Credits</i>		
" 23	2 Fuller Batteries	\$1.50	
	2 lbs Electric Sand .16.....	.32	
	1 Headband with 2 receivers	1.25	
	1 Head Band.....	.35	
	2 Extension Bells	2.50	
	2 Telo Cords 2 ft .11	.22	
		<u>6.14</u>	18.26
	<i>Petty Cash Expenses</i>		
" 1	Expenses Louis F. Ott to M. E.		
	S. Cy.....	.40	
" 20	Expenses F. C. Devinald to N. Y.	.50	
" 21	" " C. F. Fried to N. Y.....	.50	
" 24	" " J. E. Burns to Orange. .	.10	
		<u>1.50</u>	
	<i>From Stock Room</i>		
Aug. 29	6½ lbs Tool Steel	1.08	
	<i>Invoice U. S. Express Cy.</i>		
Aug. 17	Express from New York Batteries.....	.30	
	<i>Pay Roll Week Ending Aug. 7-1901</i>		
	John F. Ott Aug. 6 1 day	4.17	
	F. Hofbauer " 7-12 hours 32½..	3.90	
	<i>Louis F. Ott</i>		
Aug. 1	10 hours Aug. 7-10 hours		
	Total 20 hrs .15.....	3.00	
		<u>11.07</u>	
	<i>Pay Roll Week ending Aug. 14-1901</i>		
	John F. Ott Aug. 13-1 day.....	4.17	
	F. Hofbauer 43 hours .32½.....	13.98	
	Louis F. Ott 10 " .15.....	1.50	
		<u>19.65</u>	
	<i>Pay Roll Week ending Aug. 21-1901</i>		
	John F. Ott 1½ days at 4.16½.....	6.25	
	F. Hofbauer 5 hours .32½.. ..	1.62	
	Louis F. Ott 35 " .15.....	5.25	
		<u>13.12</u>	
	<i>Pay Roll Week ending Aug. 28-1901</i>		
	John F. Ott 1 day at 4.16½.....	4.17	
	F. Hofbauer 55 hours .32½.....	17.88	
	Louis F. Ott 35 " .15	5.25	
		<u>27.30</u>	119.46

September 1901

From Stock Room

"	7	24 $\frac{1}{2}$ "	2-56 F. H. Brass M. Screws	.05
"	9	24 $\frac{1}{2}$ "	8-32 R. H. Mach. " "	.05
"		24 $\frac{1}{2}$ "	2-56 R. H. Brass " "	.05
"	10	18 $\frac{3}{4}$ "	8-32 R. H. " " "	.04
"	22	$\frac{1}{2}$ gross $\frac{1}{2}$ "	No. 2-56 R. H. Brass M. Screws	.15
"	23	1 lb	No. 19 B. W. G. C. C. Bell Wire	.31
"	24	8	Binding Posts	.48

1.13

*Pay Roll Week ending Sept. 4, 1901*F. Hofbauer 33 hours .32 $\frac{1}{2}$ 10.73*Pay Roll Week ending Sept. 11-1901*F. Hofbauer 13 hours .32 $\frac{1}{2}$ 4.23

16.09

General Expense..... 45.88

\$187.09

tracts.

17 oz .51
 .06
 25 oz .75
 .06
 70 lb .85
 .07
 70 lb .85
 .07
 .09
 75 lb .88
 .07
 .45
 .04
 4 oz .12
 15 lb .45
 0 oz .90
 .06
 .18
 .12
 75 lb .37
 .07
 50 .25
 .07
 .20
 .10
 10 lb .15
 .07
 0 oz .60
 .05
 10 lb .10
 .07
 15 lb .90
 .10
 5 lb .63
 .05

[31558]

United States Patent Office.

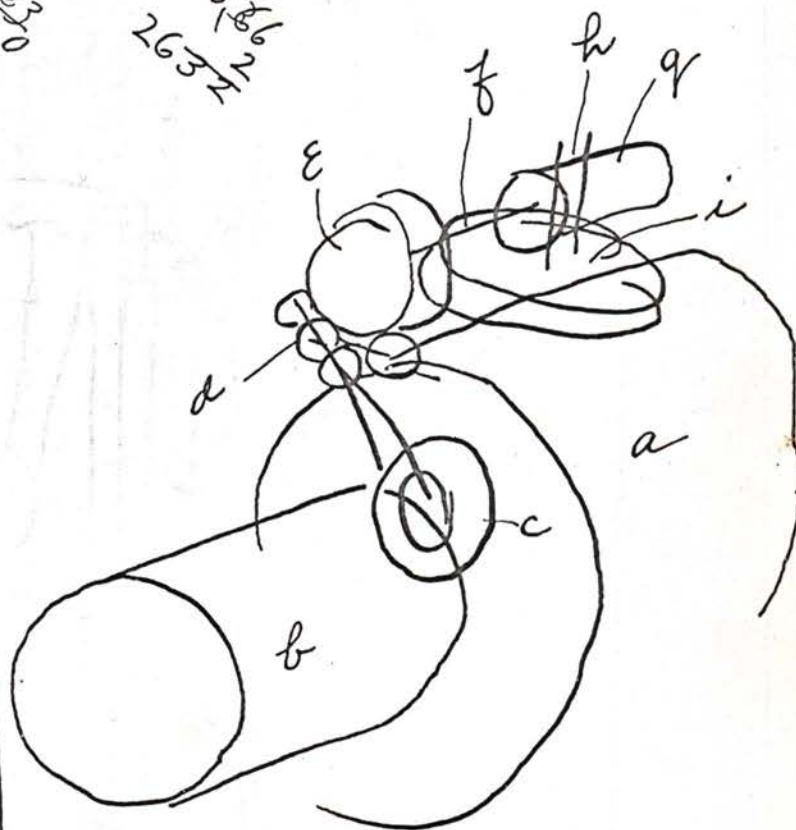
Edison } Interference

25677

Edison's Graphophone

Herb W. Wright

Official Examiner



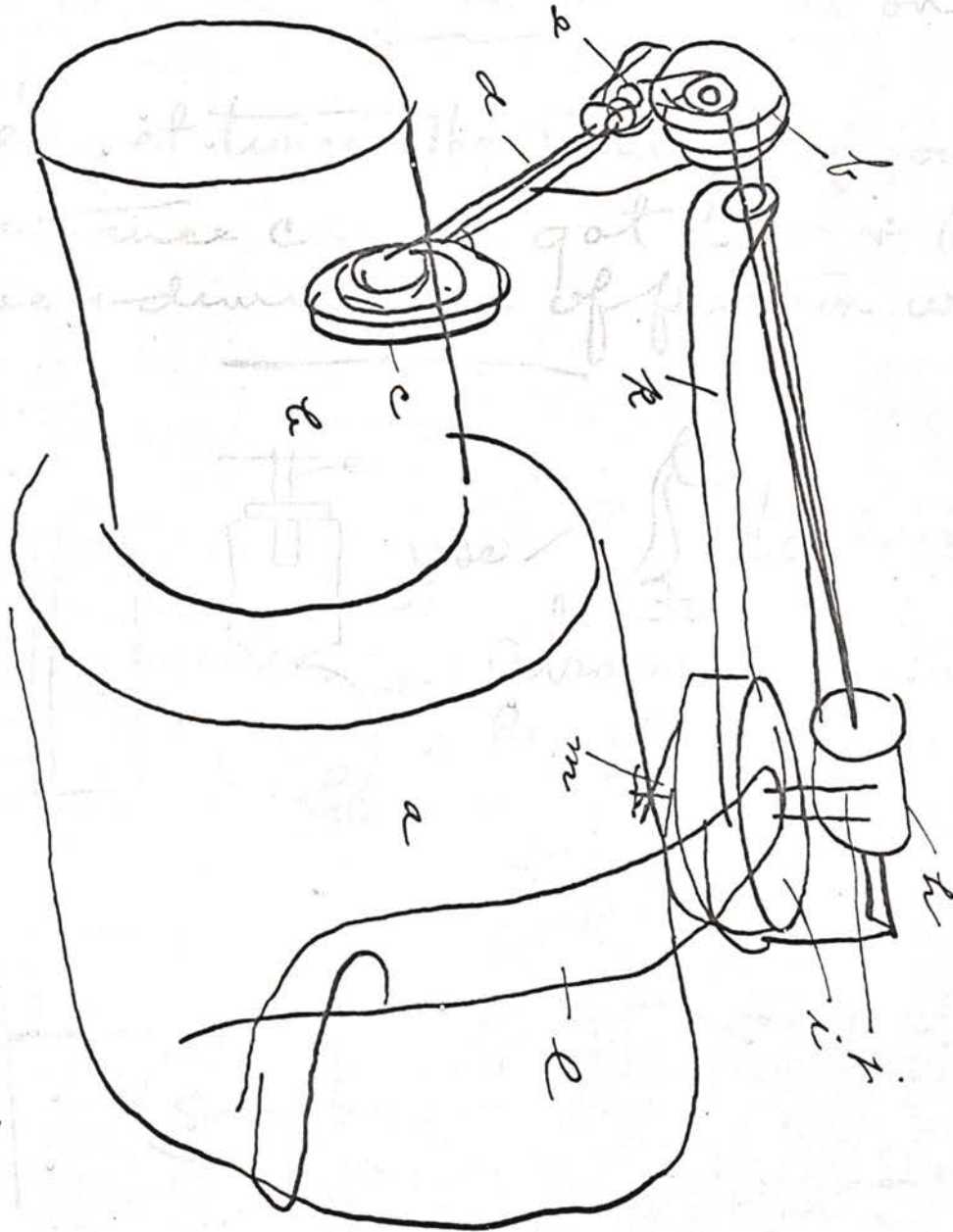
Recording Telephony

May 29/02

J. F. Gt.

United States Patent Office
Edison
v
Macdonald } Interference
25677

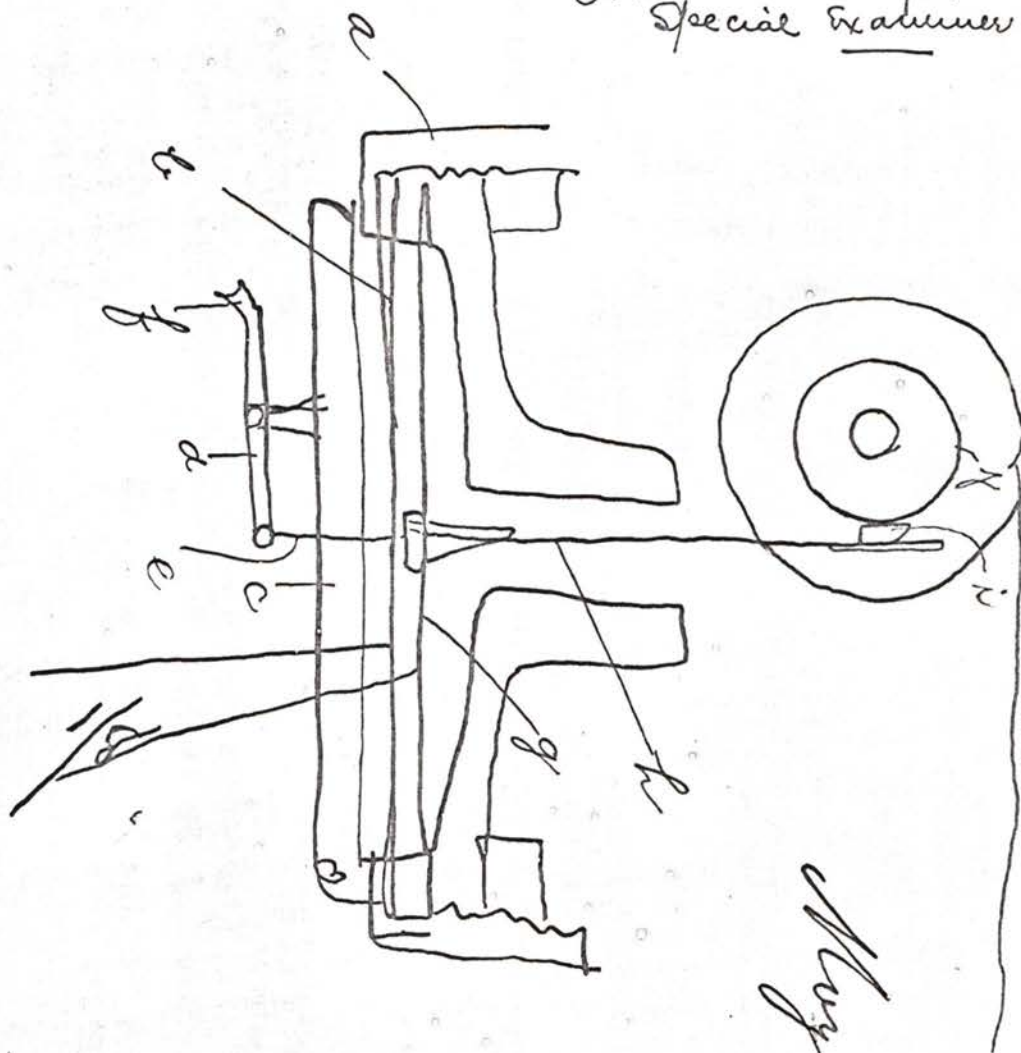
Edison's Exhibit Recording Telephone Sketch No 2.
Herbert W. Wright
Special Examiner.



Recording Elephant
May 29/02

United States Patent Office
Edison
v
Masdonald } Interference
25-677

Edison's Exhibit Recording Telephone ^{Sketch No 3}
Herbert W Knight
Special Examiner



May 1902

J. D. Pitt

John Ott -

Make Micrograph pens
of Port Henry Magnetic ore get a crystal
there is some in top floor library
among the iron ore -

Another pen of Iron Pyrites +
Monosulphide of Nickel
Gold -

United States Patent Office
Edison } Interference
Macdonald } 25677

Edison Exhibit Note No. 1
Herbert Wright
Special Examiner

May 1902

J. F. Ott.

John

May 1902

J.F.C."

Make following Cylinders for
small Malagraph ~~to~~ make
them same size as chalks when
moulded & ~~the~~ bore them out ^{to face} but
do not turn off as ^{surface} ~~face~~ Freddy
alt will ~~ff~~ turn them to size

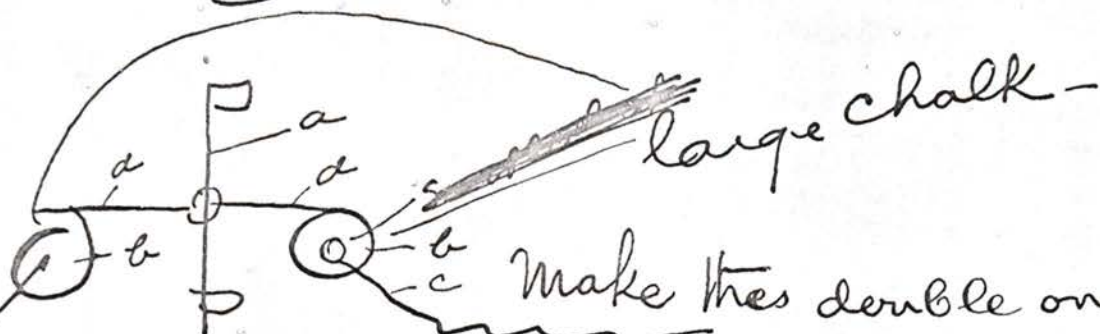
Sulphide of Copper
Best Thermo alloy - Freddy make it for you
Metallic Magnesium

"	Aluminum	✓
"	Iron or Steel	✓
"	Antimony	✓
"	Zinc	✓
"	Cadmium	✓
"	Bismuth	✓
One of	Bone	✓
"	Horn	✓
"	glue	—

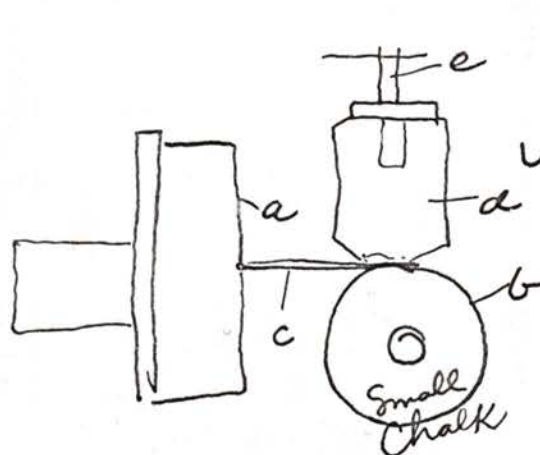
✓	Walrus hide	—
✓	paper, bond paper cut in disks	—
✓	Mica, I will give you a piece to turn it from	—
✓	Steatite (Soapstone)	—
—	Truck Kid Leather	—
✓	Sheepskin parchment cut in disks	—
✓	Rawhide	—
✓	Boxwood	—

TAE

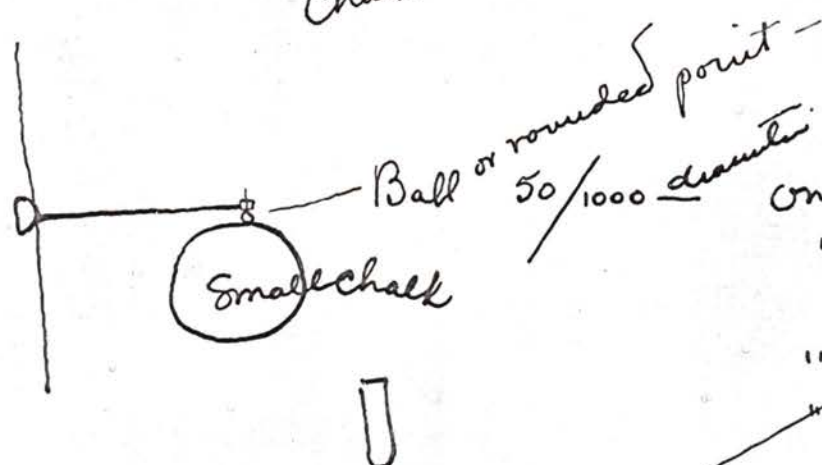
John - Make these



should get twice the volume of sound
as resistance can be got low & both
increase & diminution of friction will help



use  to do it will
also one made with
Reg phonograph diaphragm



one of platinum
" Pt + Ir
" Iridium
" Iridosmium
Nickel
J. F. Ott.

Osmium Iridium

May 1902

Make these points
about 1/8 to 1/4 long
& easily inserted & fastened
in end of arm

United States Patent Office

Edison
vs
Macdonald } Interference
 } No 25677

Edison's Exhibit, Charles Receiver Patent

Herbert Wright.

Special Examiner

T. A. EDISON.
Telephone.

No. 221,957.

Patented Nov. 25, 1879.

Fig. 1.

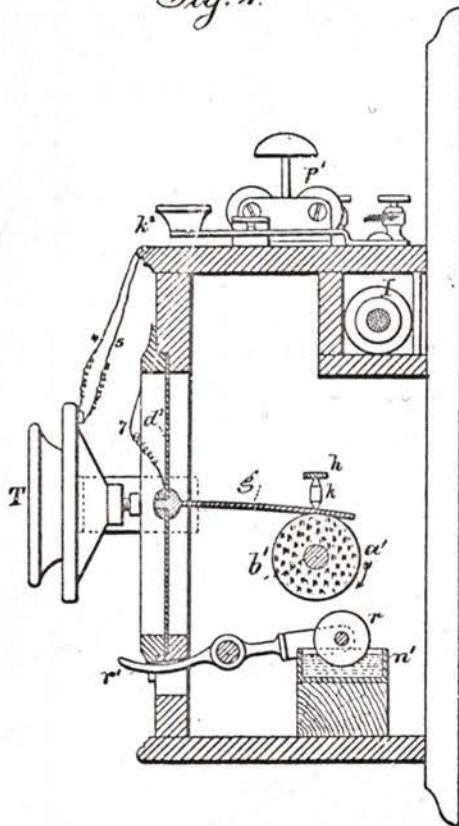


Fig. 2.

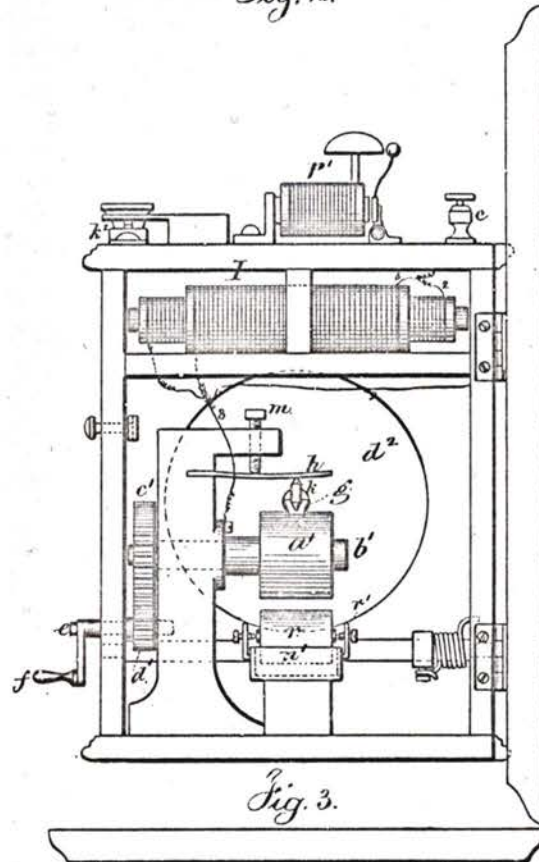
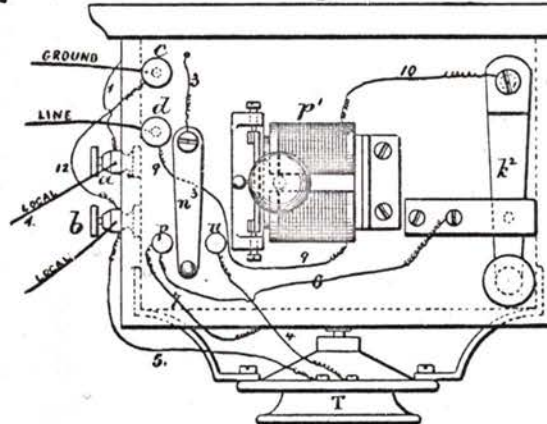


Fig. 3.



Witnesses

Chas. H. Smith
Harold Serrell

Inventor

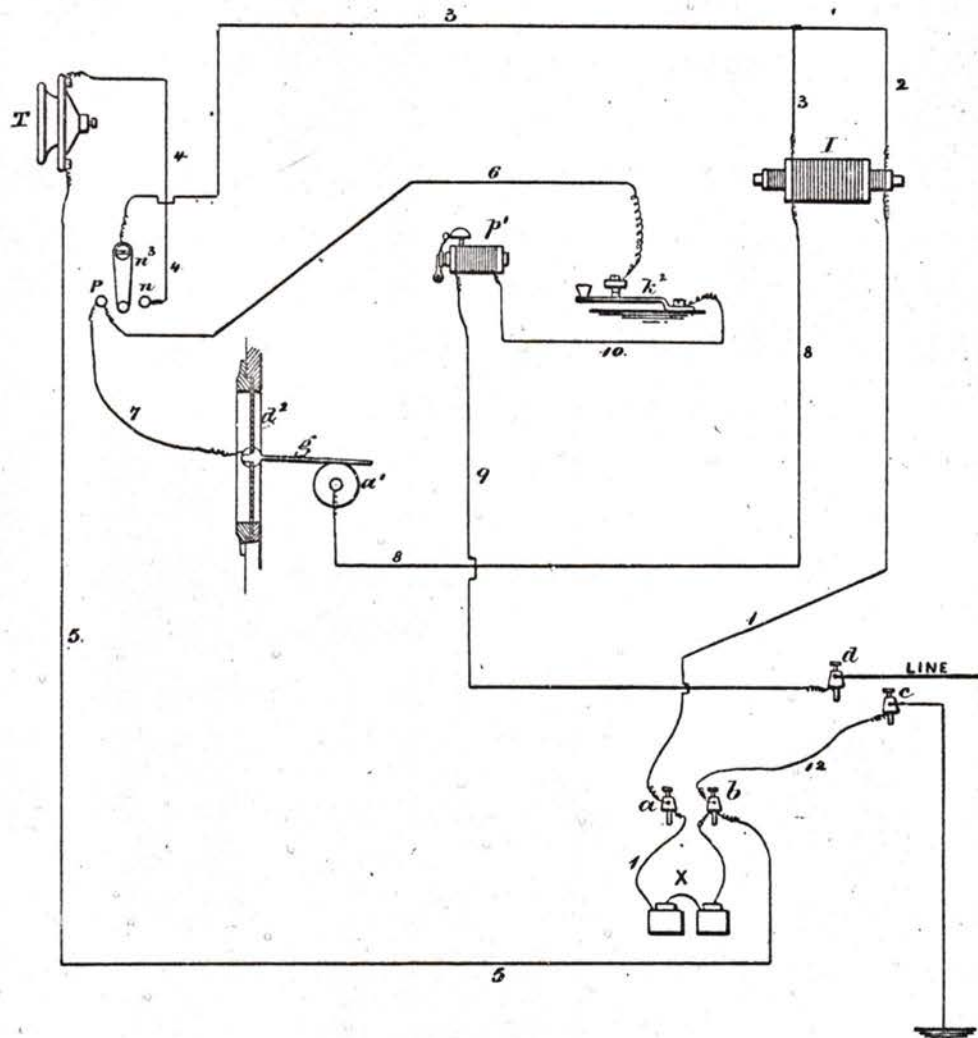
Thomas A. Edison
per Samuel W. Serrell atty

T. A. EDISON.
Telephone.

No. 221,957.

Patented Nov. 25, 1879.

Fig. 4



Witnesses

Char. H. Smith
Harold L. Lurrell

Inventor

Thomas A. Edison.
per Lemuel W. Lurrell
Att'y

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

IMPROVEMENT IN TELEPHONES.

Specification forming part of Letters Patent No. 221,957, dated November 25, 1879; application filed March 31, 1879.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the State of New Jersey, have invented an Improvement in Telephones, (Case No. 175,) of which the following is a specification.

The object of this invention is to transmit sounds electrically to a distance and reproduce the same with great power and without loss of volume.

The peculiar action upon which this invention is based was patented by me January 19, 1875, and numbered 158,787. An application of this action to telephony was also applied for by me July 20, 1877, No. 141, in which there is a band of paper moving beneath a point connected to the diaphragm. This feature, therefore, is not broadly claimed herein.

The present application consists more particularly in devices which make the invention perfectly practicable for use in commerce, and render the same reliable and effective.

In the drawings, Figure 1 is a section of the apparatus. Fig. 2 is a view of the back of the box. Fig. 3 is a plan view, and Fig. 4 is a diagram representing the connections to the line, local circuit, and various parts of the apparatus.

a' is a cylinder of compressed chalk soaked in an electrolytic solution, such as a caustic alkali, that it may become a conductor of electricity. I will mention that any finely-divided non-conducting material or porous body having capillary pores, and which has no chemical action upon the absorbed solution, may be used. This cylinder is secured to a shaft, b' , and the whole is rotated by the operator by means of the toothed wheels c' d' , shaft e , and handle f . Worm and pinion may be substituted, and motor-power of a clock-work or analogous motor replace the hand of the operator.

Resting upon the cylinder a' is a flat spring, g , connected to the diaphragm d' . This spring is pressed upon the chalk with a pressure of several pounds by means of the wire k , and spring h , the screw m serving to increase or decrease the amount of pressure.

The line-wire is connected to the spring g , while the earth-wire is connected to the shaft

on which the cylinder a' is secured. If, now, the cylinder be rotated in the direction shown by the arrow and no current passes, the normal friction of the spring g upon the surface of the cylinder a' will be very great, and the spring will be carried forward in the direction of the rotation of the cylinder, thus pulling inwardly the diaphragm d' . If, now, a current passes whose direction is such that hydrogen will be produced upon the surface of the spring g in contact with the chalk, the friction will be reduced to an extent proportionate to the strength of the current; hence the diaphragm will regain its natural position and continue there as long as the current passes. If, now, the current ceases, the normal friction at once is re-established, and the traction increases, and the diaphragm is instantly pulled inwardly again. If, now, a current in the opposite direction is transmitted, the effect is scarcely noticeable, as the evolution of oxygen upon the surface of the spring g does not, except with a few saturations, decrease the friction like hydrogen, but, on the contrary, generally tends to increase the normal friction; hence I allow a constant current to circulate on the line, and am thus enabled to utilize the opposite waves by causing them to weaken the constant current, which is always in a direction to evolve hydrogen on the surface of the spring g .

If no constant current were upon the line, the waves in one direction only would produce a limited effect; but by using a constant current circulating upon the line in addition to the waves of similar and opposite polarity, one polarity of wave is added to that of the current, and the other wave neutralizes, or nearly neutralizes, the constant current; hence the tendency of one wave is to produce a lessening of friction of, say, five units, which, added to that produced by the constant current—say five—together give ten units. If, now, an opposite current is sent, it neutralizes the constant current, and we have the normal friction of the cylinder, whereas if no constant current were used one current would lessen the friction by five units, and the opposite current would perform no work.

n' is a receptacle containing water, and resting in the water is a roller, r , composed of any flexible absorbent substance, such as sponge or felt.

A lever, r' , to which the roller is attached, and by which the roller may be brought in contact with the cylinder a' , extends through the box to the outside. The object of this device is to supply the cylinder with water lost by evaporation, and make it a conductor to the electric current.

In practice, when all the apparatus is inclosed in a cast-iron case, the loss by evaporation is very small; and if the roller be held against the cylinder and the cylinder be rotated three or four times the chalk will take up sufficient moisture so that it will perform its functions for a week or more without again wetting it.

The connections are as follows: T is a carbon telephone-transmitter, placed in a local circuit with an induction-coil, I , and local battery X . If the position of the switch-lever n^2 is on the button n , then the current proceeds from the local battery X via wire 1, primary coil of I , wire 2 to 3; thence to the switch-lever n^2 , wire 4, through the carbon transmitter T ; thence by wire 5 to the post b ; thence to the battery.

The sonorous waves of the voice are translated into electric waves of a positive and negative character in the secondary coil of the inductorium I in the well-known manner.

The connections of the main line are as follows: The line from the distant station enters at the post d ; thence via wire 9 to the call-bell electro-magnet p' ; thence via wire 10 to the key-lever k^2 ; thence by wire 6 to the point p of the switch, and by wire 7 to the spring g of the receiver; thence through the moist chalk to wire 8, to and through the secondary coil; thence via wire 3 to the switch-lever, which, it will be remembered, is in n ; thence by wire 4 through the transmitter to wire 5; thence to post b , and by wire 12 to the post c , which is connected to the earth. I will mention that either of the posts d or c may be connected to the ground or line.

It will be noticed that the main line passes through the transmitter, which is connected to the local battery; hence a portion of the current leaks into the main line, and it is this portion which thus leaks into the line that serves as a constant current for short lines; but if the line be too long, or has too great a resistance, this small leakage-current is so weakened as to be insufficient to produce a lessening of friction between the spring g and the chalk; hence I insert one or more cells in the main line.

While the switch is in this position—i. e., the lever in contact with n —transmitting and receiving can go on simultaneously. By turning the switch-lever to the point p the telephonic apparatus is disconnected, and the call-bell apparatus p' becomes operative. The line

enters at the point d , passes through the call-bell magnet via wire 9, and by 10 to key k^2 ; thence via 6 to p , and by switch to wire 3, and by 2 through the primary coil and via 1 to local battery, through that to post b , and by 12 to post c and to earth. By depressing the key k^2 the circuit is opened and closed, and the two local batteries—one at each end of the line—become operative to ring the bell.

I will mention that the two receivers herein described and the two transmitters may all be connected in one line and operated without the aid of induction-coils, but the results are not equal to that from the use of the coil; also, that the receivers will act as transmitters by reason of the fact that when the spring g and chalk are at rest the resistance of the whole is generally about twenty-five hundred ohms, and this resistance is reduced instantaneously to two hundred or three hundred ohms by the slightest movement of either the chalk or the spring; hence the movement of the diaphragm d' by the voice produces the same result, or nearly so, as the carbon transmitter. If advantage is to be taken of this fact, the surface of the spring g should be reduced to increase the effect, and an induction-coil having a primary coil of high resistance used in connection with the apparatus, although it is not absolutely necessary, as the direct results are nearly as good.

In preparing the chalk I prefer to use a salt of mercury mixed with caustic soda. The action takes place no matter what the proportions are. The mercury salt I prefer to use is the acetate of mercury.

I will mention that this moisture of the chalk may be regulated automatically by taking advantage of the fact that the normal friction of the chalk increases as it becomes drier.

A spring resting on the chalk is connected to the wetting-roller, and has such a pressure and counteracting spring that when the chalk has its proper moisture the friction during rotation is insufficient to produce the necessary traction to lift the roller; but when it becomes drier the traction becomes sufficient to lift the wetting-roller, and it supplies moisture until the traction is reduced below a certain point and it falls.

I claim as my invention—

1. The combination, with the acoustic telegraph and diaphragm, of a roller that receives a revolving motion and contains an electrolytic material, and a spring or presser connected with the diaphragm and resting upon the roller, substantially as set forth.

2. The combination, in an acoustic telegraph, of a moving surface containing electrolytic material, a diaphragm, a presser or spring extending from the diaphragm and resting on such surface, a screw through a fixed support acting upon the presser to vary or adjust the friction between the moving surface and the presser, substantially as set forth.

3. The roller a' , revolved by power, and the

presser *g* and diaphragm *d*, in combination with the receptacle *n* for liquid and the transfer-roller *r*, substantially as set forth.

4. The arrangement of local circuit, magnetic call, telephone-receiver, telephone-transmitter, switch, and line-connections, substantially as set forth, whereby the call and the receiving-instrument are in the line-circuit,

and the local battery is also put upon the line, substantially as specified.

Signed by me this 24th day of March, A.D. 1879.

THOMAS A. EDISON.

Witnesses:

STOCKTON L. GRIFFIN,
WM. CARMA.

Legal Box 117

BOX No. *117*

United States Patent Office.

INTERFERENCE No. 25,677.

EDISON

vs.

MACDONALD.

TALKING MACHINES.

MACDONALD'S RECORD.

MAURO, CAMERON, LEWIS & MASSIE,

Attorneys for Macdonald.

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In the United States Patent Office.

EDISON

v.

MACDONALD.

Interference
No. 25,677.

**Preliminary Statement of Thomas H.
Macdonald.**

STATE OF CONNECTICUT, }
County of Fairfield, } ss. :

THOMAS H. MACDONALD, being duly sworn, says: I am the applicant whose application Serial No. 237,857, filed December 21, 1904, is involved in the above-entitled interference. I conceived the invention specified in the several counts of said interference in the latter part of the year (December) 1900. I cannot fix the date with greater precision. I discussed said invention with others at that time and also during the months of January and February, 1901. During these months I gave instructions for experimental work relating to this type of machine to several of my laboratory assistants and many experiments (relating mainly to the friction devices) were made during the first half of the year 1901. I do not know whether any sketches were made at that time, my recollection being that I communicated my instructions orally. The first complete machine

Preliminary Statement.

embodying the invention was begun in July, 1901, and completed and tested in August of that year. This was a reduction to practice of the said invention. No model, as distinguished from full sized machines, was made. I began immediately (that is, in August, 1901) to construct a second machine embodying the invention, and in that connection made sketches illustrating certain modifications which I desired to have embodied therein. This was followed by other machines, each embodying some improvements over the preceding constructions, but there being no material change in respect of that part of the invention which is involved in this interference. Work on machines for the market began in the summer of 1904, and since that time a number of such machines have been manufactured and sold in the regular course of business.

THOMAS H. MACDONALD.

Subscribed and sworn to be-
fore me this 12th day of }
February, 1906.

(SEAL.)

WM. R. MILLER,
Notary Public.

The Issues.

COUNT 1. In a phonic apparatus, the combination of a phonographic recording surface, means for rotating said surface, a carrier movable across said surface, a phonographic-stylus and friction wheel carried by the carrier, a friction member connected to said stylus and pressing against the friction wheel, and means representative of sound vibrations for varying the friction between said friction member and friction wheel.

COUNT 2. In a phonic apparatus, the combination of a traveling carriage, a friction wheel and phonographic-stylus carried thereby, a friction member pressing on said wheel and connected to said stylus, means for driving said friction wheel and means representative of sound vibrations for varying the amount of friction between the friction member and friction wheel.

COUNT 3. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic-stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, and common driving means for moving the carriage and rotating the friction wheel.

COUNT 4. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic-stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, common driving means for moving the carriage and rotating the friction wheel, and means representative of sound vibrations for varying the friction between the friction member and friction wheel.

IN THE UNITED STATES PATENT OFFICE.

EDISON, S. N. 278,549,
Filed September 15, 1905.

vs.

MACDONALD, S. N. 237,857,
Filed December 21, 1904.

} Interference
No. 25,677.

BRIDGEPORT, CONN., November 1, 1906.

Testimony taken on behalf of Thomas H. Macdonald, beginning November 1, 1906, at 10 o'clock A. M., before William R. Miller, Esq., Notary Public.

Met pursuant to notice and agreement.

Present—FRANK L. DYER, Esq., on behalf of Edison;
C. A. L. MASSIE, Esq., on behalf of Macdonald.

THOMAS H. MACDONALD, being duly sworn, deposes and says:

1 Q. Please state your name, age, residence and occupation?

A. My name is Thomas H. Macdonald; age, 47; residence, Bridgeport, Conn.; occupation, manager Factory American Graphophone Co.

2 Q. I call your attention to the invention specified in claims 15, 16, 17 and 18 of your application for patent S. N. 237,857, and ask you to state when first, if ever, you constructed a machine embodying the mechanism specified in those claims?

A. I cannot tell just when I made the first machine embodying this construction but the first one that I made which I now have in my possession was made in the early part of 1901. I also have in my possession a mechanism

embodying the particular feature of a movable carrier provided with means for mechanically operating a friction roll which was made even earlier than this machine. This was made about 1900.

3 Q. Will you please produce the machine made in 1901 and the mechanism made earlier?

Witness produces the machine which bears on its base a name plate with the words and figures "Type AO 276,728," and the same is offered in evidence and marked "Macdonald Exhibit 1, 1901 Machine."

Witness also produces the mechanism, and the same is offered in evidence and marked "Macdonald Exhibit 2, 1900 Mechanism."

4 Q. Is or is not that machine the same in its mechanical parts as it was when made in 1901?

A. It is the same.

5 Q. Please state how you fix the date of the construction of that machine and state the circumstances which gave rise to its construction?

A. About the 1st of December, 1900, I was shown a machine in the office of the Columbia Phonograph Co. in New York, by Mr. Daniel Higham, which embodied the essential principles of what we now know as the friction roll or amplifying reproducer. The company was considering the purchase of this device and I was instructed by our President, Mr. Easton, to assist Mr. Higham in every way in developing it to a point where it would be commercial with our product. The machine as there presented by Higham had a fixed reproducer, and the machine frame carrying the mandrel was fed along by a one hundred thread screw. This construction was not considered practical, and one of the first thoughts was a mechanism whereby the carriage could be made to travel as we ordinarily use it and still operate the friction roll as Higham had arranged it. The thought occurred to

me at this time that I could drive the friction roll by means of a telescoping arm or rod which would be driven by a fixed pulley set above the ordinary mandrel pulley on our regular graphophone. The floating weight to be so arranged that it could be lifted by the stop and start ring at the same time the nut was disengaged. This idea I embodied in the machine which I have just offered in evidence. This machine was completed and operated early in the spring of 1901. I fix the date of completion of this machine also by the fact that on the first of May, 1901, there was begun a machinists' strike which lasted about three months. All of my workmen in the laboratory went out on this strike, which, of course, included the two men who had worked on this machine. The machine, however, was completed and operating for some time before the beginning of this strike.

6 Q. Who did the machine work in constructing that machine?

A. Two machinists in the laboratory—John F. Plummer and John A. Norton.

7 Q. Are they living at the present time?

A. They are not; they are both dead.

Q. 8. Was it built from drawings or from oral instructions?

A. It was built from oral instructions, which has been my practice in experimental work. As a rule I do not make drawings of important experimental work prior to the completion of a model, but direct my experimentalists personally. The drawing is made just as soon as I am satisfied that I have an operative model.

Q. 9. Was there a drawing made of this machine?

A. I think there was, but have not been able to locate it thus far.

Q. 10. Is Exhibit 1901 Machine a full-sized machine or a model?

A. It is a full-sized operative machine complete in every detail.

Q. 11. Will you please describe the construction and operation of your invention that you find embodied in the machine, so far as your invention here is in issue?

A. My invention in this machine consists in a traveling carriage provided with a friction roll capable of being revolved by means of a shaft revolved from the motor. The friction roll is in to a portion of the carriage directly below the diaphragm. To the roll is attached a shaft with a groove cut in one side its entire length. This shaft is carried out to the side of the machine and passes through the centre of a belt-pulley. This pulley is arranged to rotate on a fixed bearing fastened to the frame of the machine and remains of course in one position. When the machine is operated this belt-pulley rotates the shaft by means of a pin fastened in the hub of the pulley, the end of which extends in the spline or groove cut into the shaft. The spline permits the shaft to slide freely through the pulley while it is rotated. This is for the purpose of compensating for the travel of the carriage across the record. This device I have called a telescoping arm, from the similarity of the movement as it resembles the opening and closing of a telescope while in operation.

Q. 12. Please describe the additional features of the amplifying device that are embodied in Macdonald Exhibit No. 1?

A. The additional features in this apparatus consist of the friction band which is applied to the friction roll; the stylus lever, one end of which rests upon the record surface, the other end being attached by means of a wire to one end of the friction band; the weight lever, which is hinged to the carriage, and whose weight is carried upon the reproducing lever maintaining a pressure against the record thereby; a lift-lever, whose operation disengages the feed nut from the feed screw, and also lifts the weight lever so as to disengage the reproducer from the record, permitting the carriage to be moved freely by hand in either direction. The other features are a connection from the other end of the friction

band to the diaphragm; and an adjustable lever which is utilized to increase or decrease the pressure of the friction band upon the friction roll, and by this means varying the friction.

Q. 13. To what extent was this machine Macdonald Exhibit No. 1, used?

A. It was exhibited during 1901 and 1902 to practically all the officials of the company, and was used by me as a model for studying the principle of sound reproduction by frictional means. A great many sound records were reproduced from this machine at various times during the years 1901, 1902 and 1903 and 1904, and the machine is still operative.

Q. 14. What were the results of the operation of the mechanism of Exhibit 1901 Machine in respect of those parts thereof which are of your invention?

A. The operation of these parts was entirely satisfactory.

Q. 15. Did Mr. Higham subsequently improve on the construction of the friction devices?

A. He did.

Q. 17. Please name some of the officials of the company who saw this machine and witnessed its operation in the year 1901?

A. Mr. E. D. Easton, the president; Mr. Philip Mauro, director; Mr. Victor H. Emerson, supt. of the Record Dept.; and others.

Q. 18. Are there any employes of the company now in the factory who saw it in operation in 1901 or 1902?

A. There are, Mr. E. H. Byrnes, foreman of the laboratory, Mr. F. C. Hinckley, laboratory draughtsman, and others, saw this machine operated several times in 1901 and 1902.

Q. 19. When did you next build a machine embodying the features already described as present in Macdonald Exhibit No. 1?

A. In 1902 I constructed the second machine substantially the same as the exhibit, except that the

diaphragm was placed over the cylinder and horizontal. The other features were substantially the same as in Macdonald Exhibit No. 1.

Q. 20. Is that 1902 machine still in existence?

A. It is not. Portions of it are in existence, but the machine itself was afterwards utilized in a friction roll experiment on disc machines.

Q. 21. What were the results of the operation of the 1902 machine?

A. As far as we could see there is no difference, the position of the diaphragm did not seem to change the character of the reproduction.

Q. 22. Please refer to Macdonald Exhibit No. 2, 1900 Mechanism, and state how you fix the date of its construction?

A. As stated in my answer to Q. 5, I first saw Higham's friction roll device about the 1st of December, 1900, and began work immediately upon a practical working machine, as further stated in my answer.

Q. 23. Was this machine, Macdonald Exhibit No. 2, completed before Exhibit No. 1 was begun?

A. It was.

Q. 24. What tests, if any, were made of Exhibit No. 2, and with what results?

A. It was tested with various records and found to operate successfully.

Q. 25. Are there now in the factory any employes who saw and heard the Macdonald Exhibit No. 2?

A. There are; the same who saw and heard Exhibit 1.

Q. 26. Please describe the features of your invention here in issue that are present in Macdonald Exhibit No. 2.

A. The features of my invention in Exhibit No. 2 are the telescoping arm and the means for connecting it to the motor. It consists of a friction roll carried in a bearing below the diaphragm. To one end of this friction roll is attached a shaft having a groove or spline cut in one side. This shaft is arranged to slide in a tube one end of which

is attached to a pulley carried by the frame of the machine. This pulley is arranged to operate by means of a belt driven from the motor. When the machine is in operation the belt revolves the pulley which in turn revolves the tube. In one end of this tube is placed a pin which engages in the slot cut in the shaft as described. This pin causes the shaft or rod to revolve and so revolves the friction roll. The rod is arranged to slide in and out of the tube in the same manner that I described in the operation of Exhibit No. 1.

Q. 27. Have you any other mechanism for accomplishing the same purpose?

A. I have a carriage which was built for this same machine but which was designed to operate the friction roll by means of gearing. The friction roll was placed below the diaphragm similar to Exhibit No. 1. A train of gears was carried up from the guide rod of the machine to this friction roll. The guide rod was arranged to revolve by means of other gearing attached to the motor. A spline or groove was cut the length of the rod. On this rod was placed a gear with a pin engaging this groove. When the machine was in operation, therefore, the revolving guide rod caused this gear to revolve, which in turn transmitted its motion to the train of gears causing the friction roll to revolve. The first mentioned gear was made so that it would slide freely along the guide rod, and so continuous motion was transmitted to the roll while the carriage was traveling across the record.

The witness produces the mechanism, which is offered in evidence as "Macdonald Exhibit No. 3, Mechanism."

Q. 28. When did Mr. Higham bring to your notice the improved friction devices referred to in answer to Q. 15?

A. Sometime in June or July, 1904.

Q. 29. Did you subsequently construct any machine or

machines embodying Mr. Higham's improved friction devices, and also embodying the invention here in issue ?

A. I did.

Q. 30. Is that machine still in existence ?

A. It is not.

Q. 31. Can you produce a blue print of the drawing of that machine ?

A. I can, and do.

The witness produces a blue print, which is offered in evidence as " Macdonald Exhibit No. 4, Blue Print of 1904."

Q. 32. Who made the drawing, if you know, and when ?

A. Mr. Frank C. Hinckley, laboratory draughtsman, and it was begun September 1st, 1904.

Q. 33. What relation, if any, does this blue print bear to the Patent Office drawings of your application here in Interference ?

A. The Patent Office drawings were prepared directly from this drawing.

Q. 34. When did you begin the construction of machines for the market embodying the inventions here in issue ?

A. In December, 1904. The completed drawing of the working model was begun November 3, 1904.

Q. 35. Can you produce a copy of that drawing ?

A. I can, and here produce it.

Q. 36. Who made this drawing of which you now produce the blue print, and when was it begun ?

A. It was made by Mr. Frank C. Hinckley, and was begun November 3d, 1904.

The blue print is offered in evidence as " Macdonald Exhibit No. 5, 2d Blue Print of 1904."

Q. 37. Please refer to Macdonald Exhibit No. 5 and describe the features of the invention here in issue that are found in that drawing ?

A. The friction roll "A," its bearing "B," telescoping shaft "C," the spline cut therein "D," the pin for engaging in this spline "E," the revolving tube "F," its connection with the motor driving it "G," the friction band "H," the connection to the diaphragm "I," its connection to the weight-lever "J."

Q. 38. To what extent have machines constructed in accordance with Exhibit No. 5 gone into commercial use?

A. To the extent of many thousand, beginning with December, 1904.

Q. 39. Are these machines now a regular product of the American Graphophone Co.?

A. They are.

Q. 40. Has this same machine, Macdonald Exhibit No. 1, been an exhibit in any other interference?

A. It has—Interference No. 24,677, Macdonald vs. Gilbert.

Q. 41. And the two blue prints just offered in evidence were exhibits in the same interference, were they not?

A. They were.

Q. 42. Will you produce for the inspection of Edison's counsel a specimen of the machines now put out commercially, and embodying your inventions here in issue?

A. I now produce such a machine.

The machine is identified as "The Twentieth Century Graphophone."

CROSS-EXAMINATION BY MR. DYER:

x-Q. 43. Having reference to Macdonald's Exhibit No. 2, is this machine in operative condition at present?

A. It is not.

x-Q. 44. After having constructed your Exhibit No. 1 machine, why did you wait until December 21st, 1904, before applying for a patent?

A. The friction device was not of my invention. I had

experimented with it considerably but never succeeded in producing a machine that I considered commercial, and the devices were set aside as an uncompleted experiment; but when Mr. Higham, however, appeared in 1904 with a vastly improved friction device, I then saw that the commercial problem had been solved. I applied Mr. Higham's new device to my invention of 1900 and 1901 and produced a practical machine, for which patent was applied for.

x-Q. 45. I understand that the second machine constructed by you in 1902 and referred to in answer to Q. 19 was dismantled and used in connection with other experiments; is that correct?

A. It is.

x-Q. 46. Having reference to your Exhibit No. 3, was this device ever made use of in connection with the other parts of the graphophone?

A. It was.

x-Q. 47. And like the other Exhibits, was that also dismantled for the purpose of making further experiments?

A. It was dismantled because the gearing introduced a friction noise or rumbling in the reproduction. The rest of the machine was utilized in other experiments.

x-Q. 48. You state that after Mr. Higham brought to your attention his improved friction devices in June or July, 1904, you constructed the machine embodying the same but that that machine was not in existence. What became of it?

A. Parts were utilized in making up the first machine which became our regular working commercial model.

Counsel for Edison enters timely objection to the introduction as exhibits of the two Blue Prints, Macdonald Exhibits No. 4 and No. 5 respectively as relating to matter not contemplated by Macdonald Preliminary Statement, and motion will be made to have the same expunged. Without prejudice to this objection the cross-examination is continued.

x-Q. 49. Do I understand that work on the commercial machines was commenced by you by the making of drawings which were started in November, 1904?

A. The making of the drawings was one of the many preliminary steps, and I am not certain that the drawing was the first one, but it was one of the steps when it was begun in November, 1904.

RE-DIRECT EXAMINATION :

Re-d Q. 50. In answer to x-Q. 44 you speak of "an uncompleted experiment." What do you refer to there—the mechanism for rotating the friction pulley while the carriage travels, or the operation of the friction devices themselves?

A. The operation of the friction device; the means of rotating the friction device was a completed experiment, and as a matter of fact is in use to-day, substantially as it was made by me in 1900 and 1901.

Re-d. Q. 51. Is Macdonald Exhibit No. 1 in operative condition at the present moment?

A. It is.

At this point Macdonald Exhibit No. 1 is operated by the witness in the presence of counsel for both parties.

Signature waived.

FRANK H. OSBORNE, being duly sworn, deposes and says :

BY MR. MASSIE :

Q. 1. Please state your name, age, residence and occupation.

A. Name is Frank H. Osborne ; age, 41 ; residence, 427 Wood avenue, Bridgeport, Conn. ; occupation, tool maker.

Q. 2. Where are you now working?

A. Foreman of the reproducer and recorder department of the American Graphophone Co.

Q. 3. How long have you been with the American Graphophone Co. at Bridgeport?

A. About ten years.

Q. 4. Please look at Macdonald Exhibit No. 1, 1901 Machine, and state where and when you first saw it.

A. In the laboratory of this factory, in the early part of 1901.

Q. 5. Who was working on it?

A. A Mr. Plummer.

Q. 6. How do you fix that period?

A. I fix the start of it from the date of work I myself was doing at the same time Mr. Plummer was starting with this machine, which was in January, 1901.

Q. 7. What work was that which you were doing?

A. The mounting of a large matrix for the graphophone grand record.

Q. 8. Have you any memorandum on that subject, and if so, can produce it?

A. I can.

Q. 9. What is this book which you have produced?

A. It was a shop diary that I kept of things I considered important enough to make note of.

Q. 10. Did you make the entries each day on the dates given in the book?

A. Yes.

The notebook produced by the witness is offered to counsel for Edison to inspect and the entry under date of *Jan. 9, 1901*, is:

"1st Grand Matrix Mounted today. Small ones coming fast now."

Q. 11. As I understand you, at the time you were mounting the first grand matrix Mr. Plummer was working on this machine, Macdonald Exhibit No. 1?

A. Exactly.

Q. 12. How often did you see that machine, Macdonald Exhibit No. 1?

A. I do not recall ; but a great many times.

Q. 13. Did Mr. Plummer complete the machine ?

A. Mr. Plummer started this machine and worked on it off and on up to the machinists' strike, which was in May, 1901.

Q. 14. Did you go out on that strike ?

A. I did.

Q. 15. Did you see the machine in a completed machine after you came back ?

A. I did.

Q. 16. Did you see and hear it operated ?

A. Many times.

Q. 17. In 1901 ?

A. In 1901.

Q. 18. Did it operate successfully ?

A. It did.

Q. 19. In what respects, if any at all, does the machine differ now from what it was now in 1901 ?

A. No changes to my knowledge.

Q. 20. Can you recall whether or not you saw and heard this same machine, Exhibit No. 1, operated before the machinists' strike in 1901 ?

A. Yes, I did.

Q. 21. Successfully ?

A. Yes, sir.

CROSS-EXAMINATION BY MR. DYER :

x-Q. 22. What do you mean by the mounting of a large matrix of a Graphophone Grand record ?

A. In our work we plate records, this plating is afterwards removed from the outside of the record, and this thin plating or shell which we call a matrix we put inside of a brass shell. This is what I term the mounting of a matrix.

x-Q. 23. I suppose in the 10 years that you have been employed by the Graphophone Co. you have been called upon to do all sorts of work other than mounting of matrices?

A. Yes.

x-Q. 24. Why do you associate this particular thing, namely, the mounting of a matrix, with the construction of the machine about which you have testified?

A. Because this was the first one ever plated or mounted in this factory; there being but one other one made after this one.

x-Q. 25. When was that other one made?

A. Within one month of the first one.

x-Q. 26. Is there any connection between this machine and the making of the matrix that would so associate them in your mind as to enable you to say positively that when you made the matrix you saw the machine?

A. This machine was something entirely new, so was the matrix.

x-Q. 27. As I understand it as there were two new things at the same time in the laboratory it was impressed on your mind?

A. And also that Mr. Plummer was working on this nearly all of the time between January and the machinists' strike.

x-Q. 28. Was this the first time in your experience in the laboratory that two new things were brought to your attention simultaneously?

A. No, sir.

x-Q. 29. Then is it not possible that you saw this machine when you were working on some other thing than the making of the matrices?

A. In boring out the shell to take this matrix I had cuts on the machine, a lathe, which was possibly three-quarters of an hour in running through. This gave me great opportunities to assist Mr. Plummer in working out this machine where all directions given by Mr. Macdonald were verbal.

x-Q. 30. In answer to question 19 you stated that the machine before you is not to your knowledge any different from what it was in 1901. Are you willing to swear that the machine is in exactly the same condition now that it was at that date?

A. Nothing noticeable.

The answer is given after the witness has scrutinized the machine in question.

RE-DIRECT EXAMINATION BY MR. MASSIE :

Re-d. Q. 31. While you were working on the Graphophone Grand matrix you assisted Mr. Plummer in working on this machine, Exhibit No. 1?

A. Merely assisted in suggestions, not in the actual work.

Re-d. Q. 32. Did you hear Mr. Macdonald giving Mr. Plummer oral directions about the work?

A. I did.

Re-d. Q. 33. When did the strike end?

A. About the middle of July, 1901.

Re-d. Q. 34. When and where, if ever, did you first see this machine, Macdonald Exhibit No. 2?

A. In the laboratory of the American Graphophone Co. at Bridgeport in the winter of 1901; late in the winter of 1901.

Re-d. Q. 35. You are sure it was in the winter?

A. Quite sure.

Re-d. Q. 36. Are you sure it was in the year 1901 or might it not have been in the previous winter?

A. Possibly it may have been early in 1902.

Re-d. Q. 37. Where and when, if ever, did you see this piece of mechanism, Macdonald Exhibit No. 3?

A. These two (referring to Exhibits No. 2 and No. 3) were being worked on at the same time.

Re-d. Q. 38. Were they being operated and producing sound?

A. They were.

RE-CROSS-EXAMINATION BY MR. DYER :

Re-x-Q. 39. What suggestions did you make to Mr. Plummer in reference to Exhibit No. 1 ?

A. It very often happens in giving instructions on a machine of this kind, one would not understand as readily as another the objects looked for. Mr. Plummer and I would talk over Mr. Macdonald's instructions, and in some cases I would remember or understand them better than Mr. Plummer, but exactly what the different features were I cannot now recall.

Re-x-Q. 40. You said that you heard Mr. Macdonald giving oral directions to Mr. Plummer. Do you remember what Mr. Macdonald said or the substance of his talk ?

A. No, sir.

Re-x-Q. 41. You have no recollection whatever about it ?

A. No, sir.

Signature waived.

E. H. BYRNES, being duly sworn, deposes and says :

BY MR. MASSIE :

Q. 1. Please state your name, age, residence and occupation ?

A. E. H. Byrnes ; age 35 ; residence 212 Poplar street, Bridgeport, Conn. ; occupation, tool maker ; foreman of laboratory of American Graphophone Co.

Q. 2. How long have you been employed in the laboratory of the American Graphophone Co.

A. Eight years.

Q. 3. Please state where and when, if ever, you first saw this machine, Macdonald Exhibit No. 1 ?

A. I saw it during the time it was being built.

Q. 4. Who was working on it ?

A. A man by the name of Plummer, and a John Norton.

Q. 5. Did you yourself take any part in the work of this machine?

A. I did.

Q. 6. Did you see and hear the machine operated after it was completed?

A. I did.

Q. 7. When was it that you and the others were working on this machine; about what year?

A. 1901.

Q. 8. What was the last piece of work done on it so far as you know?

A. Putting on of a larger horn-connecting tube.

Q. 9. You mean this brass cylinder at the front of the diaphragm holder?

A. Yes.

Q. 10. Is this machine (indicating Macdonald Exhibit No. 1) different in its construction from what it was in 1901?

A. No.

Q. 11. When you saw and heard it operated in 1901, did it operate successfully?

A. Yes.

Q. 12. Where and when, if ever, did you first see this machine (Macdonald Exhibit No. 2)?

A. In the laboratory of American Graphophone Company, about the same time; it was a secondary experiment.

Q. 13. Did you ever see and hear it operated?

A. Yes.

Q. 14. Did it operate successfully?

A. Yes.

Q. 15. Where and when, if ever, did you first see this mechanism (Macdonald Exhibit No. 3)?

A. In the laboratory of American Graphophone Company, about the same time; we were all working on it about the same time.

Q. 16. Did you see and hear it operated in connection with other parts of the graphophone?

A. Yes.

Q. 17. Was it operative, did it work?

A. Yes.

CROSS-EXAMINATION BY MR. DYER:

x-Q. 18. Having reference to Macdonald Exhibit No. 1, what work did you do on this machine?

A. The increasing of the air passage, changing of the gearing on motor, experimenting on the friction.

x-Q. 19. When did you make these changes?

A. I should say along in 1901.

x-Q. 20. Might it not have been in 1902?

A. No, the machine was finished before that.

x-Q. 21. How do you know this machine was finished in 1901?

A. I know it, but I don't know how I can say I do know it.

x-Q. 22. Why might it not be just as well in 1902 or 1903?

A. Well, I do keep a book and diary of just such things; I may find it in there; I don't know whether I put it down or not.

x-Q. 23. I suppose Mr. Macdonald told you that this machine was built in 1901?

A. No, he has not told me.

x-Q. 24. Were you not recently told by some one that this machine was built in 1901?

A. No, I was not.

x-Q. 25. Do you associate this machine with any event in your life that enables you to say that it was made in 1901?

A. Why, the machinists' strike was in 1902, and I remember distinctly hearing and working on the machine previous.

x-Q. 26. What time in 1902 was the strike you speak of?

A. May.

x-Q. 27. Isn't it possible this strike was in 1901 or 1903 ?

A. It is not ; 1902 to the best of my knowledge.

RE-DIRECT EXAMINATION BY MR. MASSIE :

Re-d. Q. 28. Will you, as soon as your examination is finished, make a search through your diary and see if you find any entries therein relating to these exhibits ?

A. I will.

Re-d. Q. 29. Is it your testimony that you saw this machine under construction and you saw and heard it being operated before the machinists' strike ?

A. Yes.

Signature waived.

F. C. HINCKLEY, being duly sworn, deposes and says :

BY MR. MASSIE :

Q. 1. Please state your name, age, residence and occupation.

A. My name is F. C. Hinckley ; age, 28 ; residence, 679 Iranistan avenue, Bridgeport, Conn.; occupation, draughtsman.

Q. 2. Where are you employed at present ?

A. At the American Graphophone Co.

Q. 3. How long have you been employed as draughtsman by the American Graphophone Co.?

A. A little over eight years.

Q. 4. I show you Macdonald's Exhibit No. 1. Have you ever seen that machine before, and, if so, where and when did you first see it ?

A. I have ; I saw it in Mr. Macdonald's laboratory about September, 1901.

Q. 5. You mean Mr. Thomas H. Macdonald's laboratory at the American Graphophone Co.'s factory, at Bridgeport ?

A. I do.

Q. 6. Did you see and hear it operated at that time ?

A. I did.

Q. 7. Did it operate successfully ?

A. It did.

Q. 8. Had you seen it at all before September, 1901, or any part of it ?

A. I had seen parts of it, but not assembled.

Q. 9. When and where did you see those parts ?

A. In the laboratory department a few months before September.

Q. 10. Who was working on it ?

A. Mr. Plummer was the first man and Mr. John Norton, he was the next. Some time later Mr. Byrnes worked on it.

Q. 11. How do you fix the date as being in the year 1901 ?

A. On account of the machinists' strike which took place about that time.

Q. 12. Did you ever see at the laboratory of the American Graphophone Co. another machine substantially like this one ?

A. I did.

Q. 13. What, if anything, did you have to do with it ?

A. I had nothing to do with it.

Q. 14. I show you a blue print, Macdonald's Exhibit No. 4, and ask if you ever saw the drawing from which that blue print was made ?

A. I did.

Q. 15. Who made that drawing, and when ?

A. I made the drawing, September 1st, 1904.

Q. 16. Did you place the date on the drawing yourself ; and, if so, when ?

A. I did, the day I started the drawing.

Q. 17. From what was that drawing made ?

A. The drawing was made for Mr. Macdonald and from that machine.

Q. 18. What machine do you refer to as " that machine " ?

A. This machine here (indicating Exhibit No. 1).

Q. 19. In answer to question 12 you spoke of another machine. Did you make a drawing from that other machine?

A. I made one later; that is the machine they are now manufacturing.

Q. 20. Is this a blue print of the machine you have just spoken of (indicating Exhibit No. 5)?

A. It is.

Q. 21. When did you make this last drawing, and how do you know the date?

A. November 3d, 1904. I know the date because it appears on the blue print.

Q. 22. What was this drawing, Exhibit No. 5, made from?

A. It was made from ideas of Mr. Macdonald.

Q. 23. Have you ever seen Macdonald's Exhibit No. 2 before and if so, where and when?

A. I have, in Mr. Macdonald's laboratory; I ain't sure that was the first one made.

Q. 24. Did you see and hear it operated at that time?

A. I saw it, but I did not hear it operate?

No cross-examination.

Signature waived.

DANIEL HIGHAM, being first duly sworn, deposes and says:

By MR. MASSIE:

Q. 1. Please state your name, age, residence and occupation?

A. My name is Daniel Higham; age, 42; residence, 795 State street, Bridgeport, Conn.; occupation, experimentalist and inventor.

Q. 2. Are you the same Daniel Higham who invented and patented the sound amplifying mechanisms for talking machines and similar machines that have been incorporated in what is known as the Twentieth Century Graphophone?

A. Yes, sir.

Q. 3. Can you give the numbers and dates of some of your patents ?

It is stipulated that the witness is the patentee named in patents granted to Daniel Higham on July 16, 1901, October 25, 1904, November 4, 1902, February 28, 1905.

Q. 4. When did the American Graphophone Co. first obtain the right to operate under your patents ?

A. I think it was about two years ago.

Q. 5. If there is a written contract, will you please look it up and give us the exact date ?

A. I will.

Q. 6. Did you ever see Macdonald Exhibit No. 1 before ; and if so, when and where did you first see it ?

A. In the American Graphophone Co., in Mr. Macdonald's office.

Q. 7. When was that ?

A. It was over two years ago.

Q. 8. That is, it was about the time the American Graphophone Co. obtained the right to operate under your patents ?

A. Yes, about that time.

Q. 9. When was the idea of mounting the friction device on the movable carriage first brought to your attention and by whom ?

A. It was brought to my attention by Mr. Macdonald in New York City, in the Columbia Phonograph Co. Office on Chambers street ; somewhere in 1901 ; I don't know just what month.

CROSS-EXAMINATION BY MR. DYER :

x-Q. 10. Why is it, Mr. Higham, that you are not able to recall when such an important thing as an agreement under which the Graphophone Co. was to take up your inventions

was made, nor when you saw this Exhibit No. 1, yet you have no difficulty in saying that Mr. Macdonald made the suggestion of carrying the friction wheel on the moving carriage in 1901? Why is it you are so sure about this date?

A. I recall it because on account of the 4th of July I stayed away; that is how I recall it as being the 6th of July; and I recall seeing this model because it was the first thing I saw in this factory.

x-Q. 11. You are now speaking of the time when the Graphophone Co. actually had made its contract with you to build your machines?

A. Yes.

x-Q. 12. That you say was about two years ago?

A. So it seems to me; I would like to look up the dates though.

x-Q. 13. But what I want to know is why you are so sure that Mr. Macdonald suggested the idea of mounting the friction device on a movable carriage in 1901?

A. Because it was about the time the patent was issued.

x-Q. 14. What patent do you refer to?

A. July 16, 1901.

x-Q. 15. You saw Mr. Macdonald about the time this patent issued; was that the first time you had spoken to him about this scheme of yours?

A. I think it was.

x-Q. 16. Did you call the patent to his attention?

A. No.

x-Q. 17. How did you explain the device to him?

A. I had a working model.

x-Q. 18. Are you able to say whether it was before or after the patent was issued that you saw Mr. Macdonald?

A. I couldn't say that.

x-Q. 19. But it was very close to that date?

A. In 1901.

Signature waived.

It is stipulated that if Mr. Edward Brundage were examined as a witness he would testify that he is employed in the Assistant Manager's office of the factory of the American Graphophone Co. at Bridgeport ; that he has kept a time book and that the same shows an entry dated May 20, 1901, which he would testify he made on that date, the entry stating that the machinists' and tool makers' strike began on that day. He would further testify that the same book contains an entry dated July 15, 1901, which he made on that date, that the said machinists' strike ended on that day.

JAMES T. WILSON, being duly sworn, deposes and says :

BY MR. MASSIE :

Q. 1. Please state your name, age, residence and occupation ?

A. My name is James T. Wilson ; age, 30 ; residence, 95 Hazelwood avenue, Bridgeport, Conn. ; occupation, foreman of the drilling department, American Graphophone Co.

Q. 2. Where are you employed ?

A. American Graphophone Co. factory at Bridgeport, Conn.

Q. 3. How long have you been employed at the factory of the American Graphophone Co. ?

A. Since November, 1899.

Q. 4. I call your attention to this machine, Macdonald Exhibit No. 1, and ask where and when you first saw that machine or any of the parts thereof ?

A. In the machine department of the special manufacturing department in the west building of the American Graphophone Co.'s factory, about four years ago.

Q. 5. Were you employed here during the time of the machinists' and toolmakers' strike ?

A. I was employed here at that time.

Q. 6. Did you see the parts of this Exhibit No. 1 before or after that strike?

A. After the strike.

Q. 7. Please indicate which parts of this machine you saw?

A. This (indicating the diaphragm holder) and this here (indicating the telescoping shaft) and this (indicating the sleeve in which the shaft telescopes) and pulley.

Q. 8. Do you work in the laboratory; do your duties carry you there?

A. I do not work in the laboratory; occasionally I have business there.

Q. 9. Did you have any part in the work on the things mentioned in answer to Q. 7?

A. Yes, sir; I machined this part here (indicating the large diaphragm holder on Macdonald Exhibit No. 1).

Q. 10. How long after the tool makers and machinists' strike was it that you saw the parts mentioned in answer to Q. 7?

A. It was in the fall of the same year of the strike.

Q. 11. Is it your testimony that you saw the parts of this very machine now before us; or do you mean that you saw and worked on parts substantially like these working on substantially the same principles?

A. There were parts worked on the same principles.

CROSS-EXAMINATION BY MR. DYER:

x-Q. 12. But I understand that so far as this identical machine is concerned, Macdonald Exhibit No. 1, you neither saw nor worked on it?

A. Not on that particular machine.

Signature waived.

Adjourned subject to notice.

IN THE UNITED STATES PATENT OFFICE.

EDISON

vs.

MACDONALD.

Interference
No. 25,677.**Notary's Certificate.**STATE OF CONNECTICUT, }
County of Fairfield, } ss. :

I, WILLIAM R. MILLER, a notary public in and for the County and State aforesaid, do hereby certify that the foregoing depositions of Thomas H. Macdonald, Frank H. Osborne, E. H. Byrnes, F. C. Hinckley, Daniel Higham, James T. Wilson, and the stipulated testimony of Edward Brundage, were taken on behalf of said Macdonald, in pursuance to notice and agreement, on November 1, 1906, at the factory of the American Graphophone Company, Bridgeport, Connecticut; that each witness was by me duly sworn in the presence of Frank L. Dyer, Esq., counsel for Edison; that the testimony of said witnesses was written out by John R. Petrie, in my presence; that said testimony was commenced at about ten o'clock in the forenoon of November 1, 1906, and concluded the same day; that Frank L. Dyer, Esq., was present during the examination of each witness; that the signature of each witness to his testimony was waived by consent of the parties; and that I am not connected by blood or marriage with either of the parties, and am not interested either directly or indirectly in the matter in controversy.

Stipulation.

IN TESTIMONY WHEREOF I have hereunto set my hand and affixed my seal of office, at Bridgeport, in said County and State, this day of November, 1906.

[SEAL.]

WILLIAM R. MILLER,
Notary Public.

IN THE UNITED STATES PATENT OFFICE.

EDISON, S. N. 278,549,
Filed September 15, 1905,

vs.

MACDONALD, S. N. 237,857,
Filed December 21, 1904.

Interference
No. 25,677.

90 WEST BROADWAY, NEW YORK CITY, }
November 14, 1906. }

Stipulation.

It is stipulated by and between the attorneys for the respective parties to this Interference as follows:

Attorney for Macdonald having produced a copy of application for U. S. Letters Patent filed by Alexander N. Pierman, on March 13, 1905, under the Serial Number 249,678, entitled "Friction Reproducing Attachments for Phonographs"; and attorney for Macdonald having also produced copies of the files of an Interference declared in the United States Patent Office on April 25, 1905, under Interference; No. 24,676A, between the said Pierman application and the Macdonald application involved in the present Interference and on request of attorney for Macdonald, attorney for the party Edison stipulates that the said Pierman is and for several years before filing his application has been contin-

uously employed at the Edison Laboratory, Orange, N. J.; that his said application was assigned to the New Jersey Patent Company, of West Orange, N. J.; that his attorney was Frank L. Dyer, Esq., who is attorney for the party Edison herein; and that the said Pierman, the party Edison, the said Edison Laboratory, and the said New Jersey Patent Company are all, for the purpose of the two Interferences (Nos. 24,676A and 25,677), the same in interest.

Further, that on April 25, 1905, the said Interference, No. 24,676A, was declared between the said Pierman application and the Macdonald application involved in the present Interference, the counts, four in number, being as follows:

"COUNT 1. In a phonic apparatus, the combination with primary and secondary vibrating means, of an intermediate friction device, and a movable carriage supporting said friction device.

"COUNT 2. In a phonic apparatus, the combination with primary and secondary vibrating means, of an intermediate friction device, and a movable carriage supporting said secondary vibrating means and said friction device.

"COUNT 3. In a phonic apparatus, the combination of primary and secondary vibrating means, means connecting the same, an intermediate movable friction device operating upon said connecting means, a movable carriage for supporting said friction device, and means for feeding said means and said carriage.

"COUNT 4. In a phonic apparatus, the combination of a primary vibrating stylus, a secondary vibrating diaphragm, means connecting the same, an intermediate movable friction device operating upon said connecting means, a movable carriage for supporting said friction device and a common feeding means for said carriage and said diaphragm, stylus and connecting means."

Stipulation.

Further, that in due course of said Interference No. 24,676A, the preliminary statements of the respective parties, Pierman and Macdonald, were filed and approved ; that the letter from the Examiner of Interferences, notifying the respective parties that their preliminary statements had been approved, and fixing the dates for taking testimony and for final hearing, was written and mailed to the respective parties on May 19, 1905, and received by the attorney for Pierman a day or two thereafter ; and that the said Pierman and his said attorney thereupon had access to the File Wrapper and Contents of the said Macdonald application involved in the present interference.

Further, that by said letter of May 19, 1905, the Examiner of Interferences directed that the said Pierman's testimony be closed July 10, 1905 ; that thereafter, by stipulation, said Pierman's time for closing his testimony in chief was extended to September 11, 1905 ; and that the said Pierman having taken no testimony, attorneys for Macdonald moved for judgment on the record, which was made final on November 23, 1905.

(Sd.) FRANK L. DYER,
 For Thomas A. Edison.
 C. A. L. MASSIE,
 For Thomas H. Macdonald.

IN THE UNITED STATES PATENT OFFICE.

EDISON,

S. N. 278,549,

Filed Sept. 15, 1905,

vs.

MACDONALD,

S. N. 237,857,

Filed Dec. 21, 1904.

Interference
No. 25,677.**Stipulation.**

Attorney for Macdonald, having presented to inspection of attorney for Edison a certified copy of the abandoned application of Daniel Higham, filed August 17, 1900, Serial No. 27,179; and upon request of Macdonald's attorney, Edison's attorney for the purpose of this interference stipulates as follows:

On August 17, 1900, Daniel Higham, then of Winthrop Highlands, Suffolk County, Mass., filed his application for U. S. Letters-patent, and the same received the Serial Number 27,179; the specification and drawings thereof are substantially the same as the specification and drawings of Higham's U. S. Letters-patent No. 678,566, granted July 16, 1901; the claims thereof were rejected on September 29, 1900; on November 23, 1900, said claims were cancelled, and the following substituted, viz.:

"In apparatus for reproducing with increased power a vibrating energy corresponding to sound waves, the combination of 'primary' vibrating means, with a lever to increase the vibrating force of said 'primary' means, and

'secondary' vibrating means responding to vibrating variation in frictional force resulting from vibrating variations in pressure upon a moving surface set up by said increased 'primary' vibrating force obtained by said lever, substantially as described."

It is further stipulated by attorney for Edison that the Examiner's action upon this amendment—to which action no response was ever made--was as follows :

" DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

WASHINGTON, D. C., December 8, 1900.

Mailed " " "

DANIEL HIGHAM,

Care Howson & Howson, Washington, D. C.

Please find below a communication from the Examiner in charge of your application for Phonic Apparatus, filed Aug. 17, 1900, serial number 27,179.

C. H. DUELL,

Commissioner of Patents.

It being doubted by the Examiner whether the device claimed will operate to effect the results referred to by applicant, it is requested that, if possible, a practical demonstration of the operativeness of the device be made before the Examiner of [if?] the alleged invention has been actually reduced to practice.

In the claim presented in the amendment filed the 24th ult., the "moving surface", line 6, is not a positive element of the structure sought to be patented, it being mentioned functionally and merely incidentally in referring to the secondary vibrating means. If movable means operating frictionally

upon the lever to effect responding vibrations in the secondary vibrating means, be positively defined in the claim in lieu of the functional reference to such parts, the claim when so amended will be reconsidered with reference to its allowance.

The present claim as drawn is rejected, because met in substance by the art disclosed in the patent and publications cited.

J. T. NEWTON,
Ex."

J. H. L.

Attorney for Macdonald then gives notice that, if necessary, at the hearing he will refer to the said Higham Patent and the said Higham abandoned application, copies of the same being on file in the Patent Office.

It is further stipulated by and between the attorneys for the respective parties that if Edward O. Rockwood were produced and sworn as a witness for Macdonald, he would testify that he is, and has been for five years and over, secretary of the American Graphophone Company, the assignee of the Macdonald application involved herein; that he has in his custody the original license agreement by virtue of which said American Graphophone Company is operating under the patents of said Higham (including No. 678,566, of July 16, 1901, aforesaid), the said Rockwood being witness to said agreement; and that said agreement is dated July 1, 1904.

Close of Macdonald's proofs.

(Sgd) FRANK L. DYER,
Attorney for Edison.

(Sgd) C. A. L. MASSIE,
Attorney for Macdonald.

[31264]

Fig. 1.

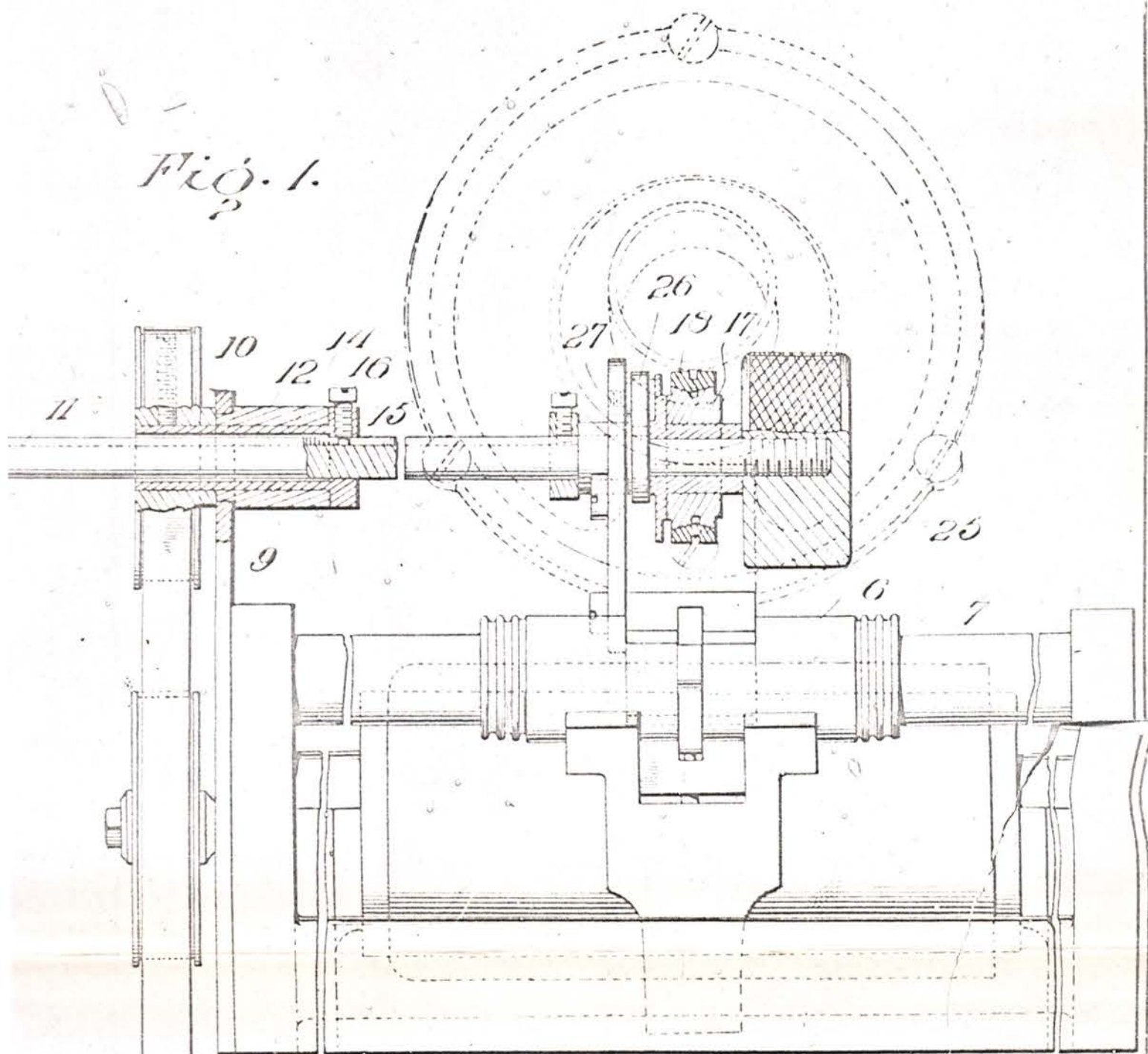


Fig. 4.

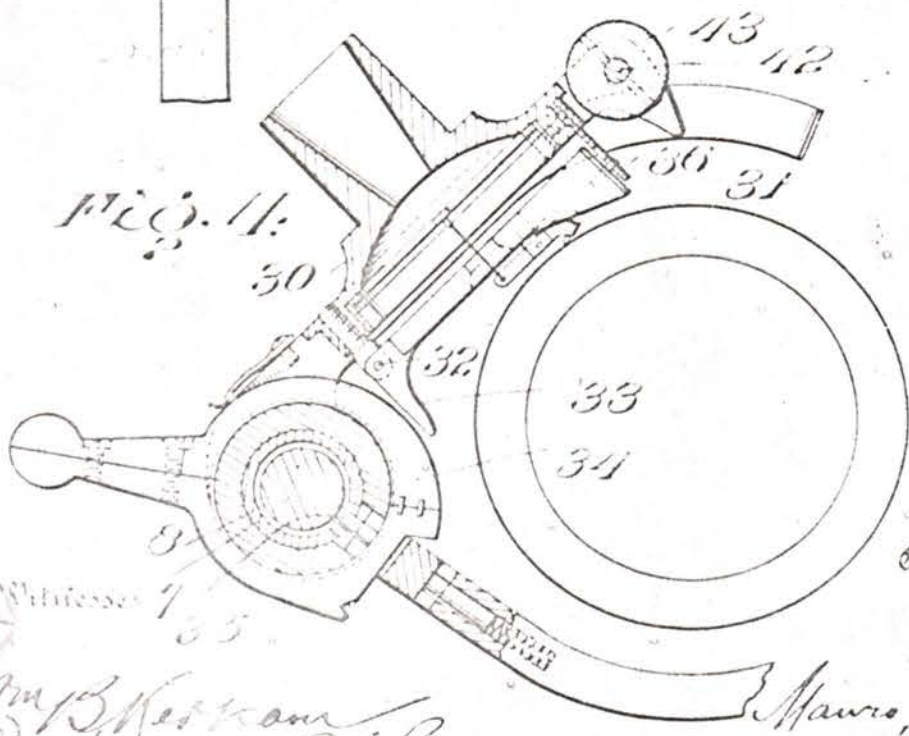
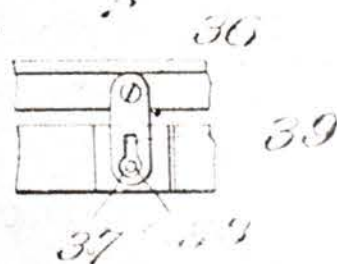


Fig. 6.



Thomas R. Macdonald,

by Messrs. Cameron, Lewis & Macdonald.

Witnesses: J. B. McKean, Gustave R. Thompson.

Fig. 2.

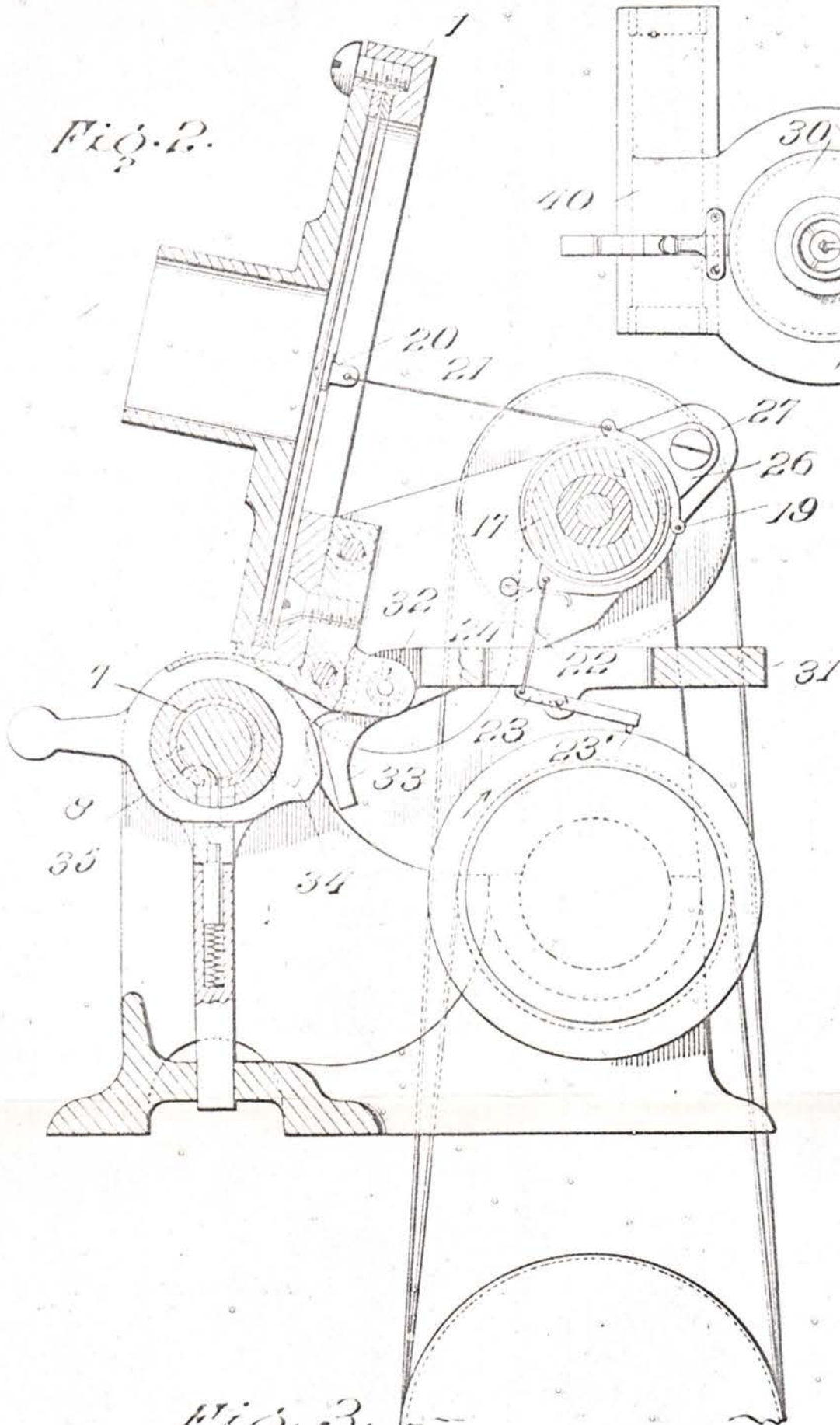


Fig. 5.

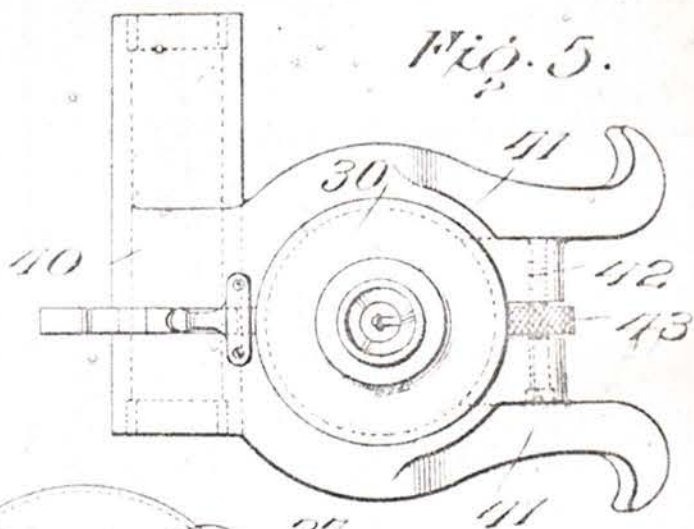
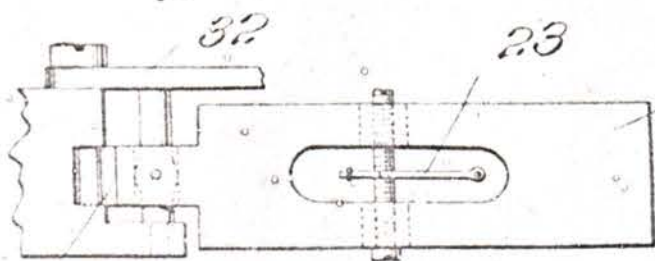


Fig. 3.



Witnesses

Wm. B. Horkam,
Gustave L. Thompson.

Inventor

Thomas A. Macdonald,
by

Mauro, Cameron, Lewis & Massey,
Attorneys.

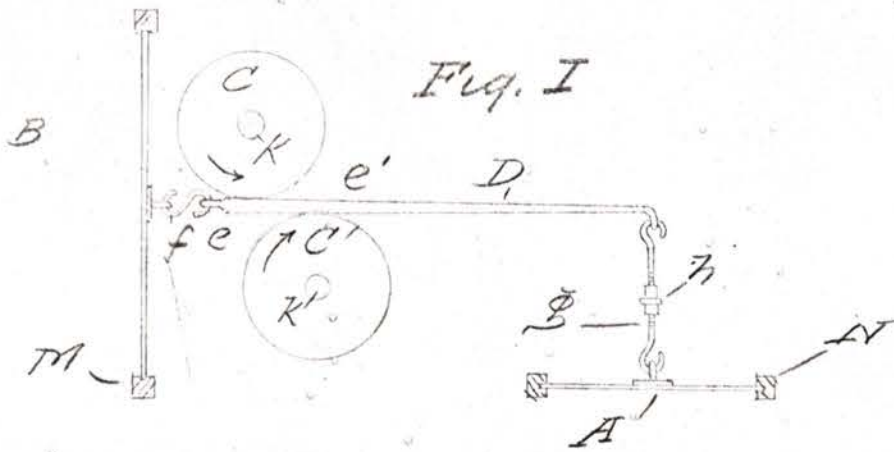


Fig. 2

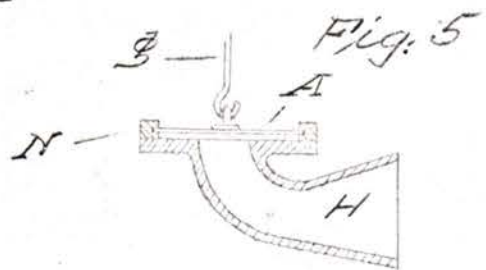
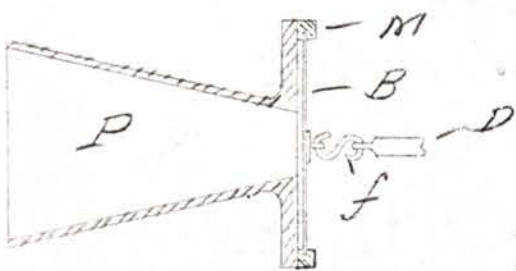


Fig. 6

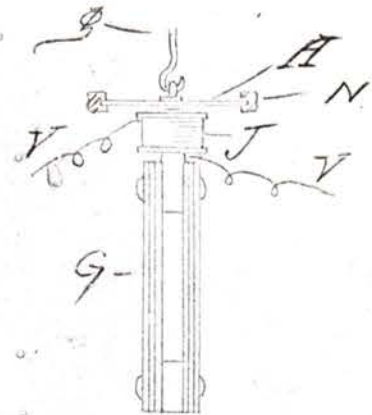


Fig. 3

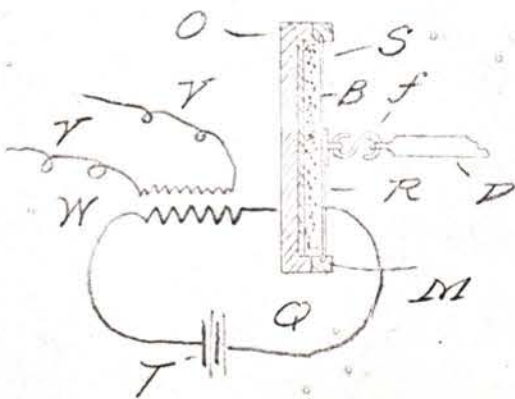


Fig. 4

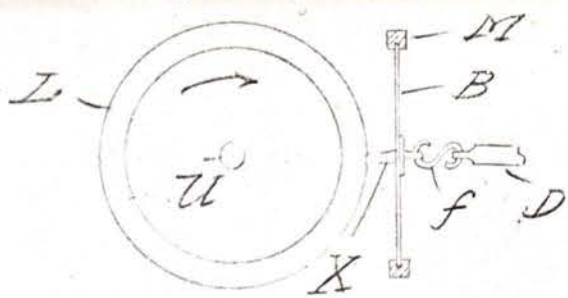


Fig. 7

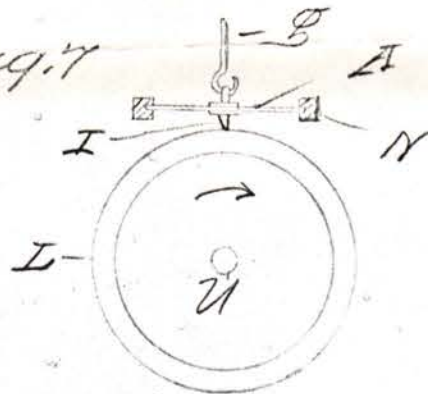
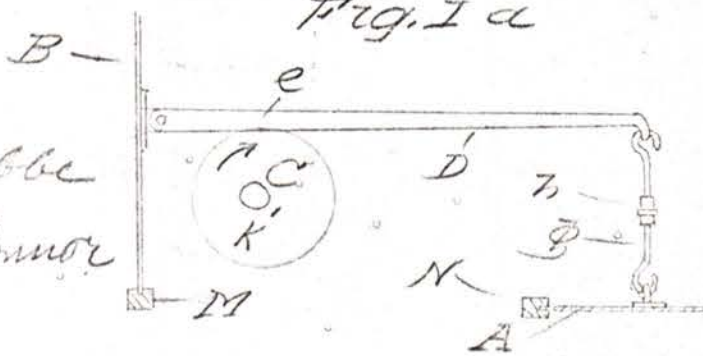


Fig. 1 a



WITNESSES:

Charles C Abbe
Sarah Carson Connor

INVENTOR

Daniel Higham
BY Howson and Howson
ATTORNEYS.

Legal Box 117

United States Patent Office.

EDISON
vs.
MACDONALD.

INTERFERENCE

No. 25,677.

BRIEF FOR EDISON.

FRANK L. DYER,

For Edison.

C. G. BURGONNE, Walker and Centre Streets, N. Y.

UNITED STATES PATENT OFFICE

EDISON
vs.
MACDONALD.

Interference
Number 25,677.

PHONIC
APPARATUS.

BRIEF FOR EDISON.

The questions presented in this case are the usual questions that arise in interferences, where priority alone requires to be determined. The law seems to be well settled and it is necessary only to ascertain what significance is to be given to the testimony taken and the exhibits filed on behalf of Macdonald. From Edison's point of view, his own testimony establishes the fact with the reasonable amount of certainty required of any junior party, that the invention defined by the several counts of the issue was reduced to practice by him prior to its reduction to practice by Macdonald. From the same viewpoint it is submitted that the testimony of Macdonald shows that anything that may have been done by him prior to Edison's reduction to practice can only be looked upon as a conception of the invention, and that any efforts to reduce the invention to practice at that time amounted to no more than unsuccessful and abandoned experiments. Should this aspect of the case be accepted by the Office, then the only question open for consideration is whether Edison by reason of his failure to file an application for a patent until about three years

after reduction to practice can now be deprived of his rights as the first inventor. Before discussing these questions, the respective inventions of the two parties should be first understood, because the nature of those inventions is such that certain doctrines are believed to be applicable to one and not to the other. The two inventions are radically different and they have been brought into interference only because the counts of the issue are drawn in extremely broad language.

Edison's Invention.

Edison's specific invention is a recording telephone, the idea being to produce an apparatus in which telephonic messages will be automatically recorded on a phonograph. The apparatus, therefore, comprises an ordinary phonograph and an ordinary chalk receiver or motograph, whose diaphragm is located adjacent to the diaphragm of the phonograph, so that the words received by the telephone will be spoken into the phonograph, and a permanent record thereof will be made. So far as the phonograph is concerned, there, of course, cannot be the slightest doubt that when sound waves are received by its diaphragm, a graphic record thereof will be made on the wax cylinder. So far as concerns the chalk receiver or motograph, there can, with equal certainty, be not the slightest doubt that electric undulations corresponding to sound waves received at the electrode thereof will be converted into sound waves and thereby be rendered audible. As a matter of fact, both the phonograph and motograph, or loud speaking telephone, are well known inventions of Mr. Edison, with which the scientific world and Patent Office have been perfectly familiar for more than twenty years, and there can be no more doubt as to the operativeness of those two devices than there can be at the present time of the Remington typewriter, or of a stock ticker. It is believed that the Patent Office can, and should, take judicial

notice of the operativeness of two such well-known devices, even if their operativeness has not been proved, as we have taken the pains to do in this case. The operativeness of a motograph and of a phonograph, individually considered, being conceded, the operativeness of an apparatus in which a motograph is combined with a phonograph and in which the diaphragm of the motograph is arranged adjacent to the diaphragm of the photograph, must necessarily follow. In a broad sense, a phonograph combined with a motograph in such a way that the sounds produced by the former will be recorded by the latter is not new, having been successfully demonstrated in this country more than fifteen years ago and being described in scientific publications in the Patent Office library, so that the Examiner can also take judicial notice of this fact. See, for example, *Electrical Review* (New York) of February 16, 1889, page 4, and *The Telegraphic Journal and Electrical Review* (London) of March 8, 1889, page 269. (Vol. 24, January 4 to June 28, 1889.) The invention on which the Edison application is based therefore is not broadly the combination of a phonograph and a chalk telephone, but the specific arrangement wherein the chalk telephone is supported by and moved with the phonograph carriage, so that the diaphragm of the motograph will always occupy the desired close relation with the diaphragm of the phonograph, suitable mechanism being employed to slowly rotate the chalk cylinder of the motograph as the carriage slowly progresses longitudinally of the rotating wax cylinder. The specific mechanism described by Edison comprises a drum 28, mounted on the mandrel shaft and engaged frictionally by a roller 29, which connects with the chalk cylinder 20 by means of gearing 31, 32, 33, 34 and 35. In this way the chalk cylinder of the motograph instead of being turned slowly by hand as in the usual way, is rotated by the same power that operates the phonograph, the mechanism being such that the chalk cylinder will be turned notwithstanding its progressive

movement longitudinally of the phonograph recording cylinder. So far as the Edison invention may therefore represent a departure in the art, it resides solely in the mechanism for rotating the chalk cylinder of the motograph and the mounting of the latter on the carriage of the phonograph. The invention is essentially mechanical and of the simplest possible character. Its consideration involves nothing new either in the phonographic or telephonic arts, but as stated the phonograph is the ordinary phonograph and operates in the usual way, and the telephone is the ordinary telephone which also operates in the usual way.

Macdonald's Invention.

Contrary to the situation present in Edison's work, Macdonald's invention is directed towards a very modern art, which at the date of the experiments on which he will no doubt rely for a reduction to practice, was comparatively undeveloped. That art is the amplification of sound waves by variations in friction between two contacting surfaces, an illustration being found in Patent No. 678,566 of July 16, 1901, granted to Daniel Higham, and referred to in the Macdonald application in interference. Macdonald sought to embody the Higham invention in a commercial talking machine, in order that the sounds that were recorded or reproduced might be amplified. Referring to this patent and to Figure 1 thereof, as a convenient illustration, the apparatus comprises a rotating friction cylinder C, with which a shoe L engages, the latter being pressed with greater or less friction by means of a lever D connected to a diaphragm A (called the primary vibrating means) and the shoe L being connected to a second diaphragm B (called the secondary vibrating means). If, for instance, sound waves are impressed on the diaphragm A, the lever D will be vibrated so as to vary the friction between the shoe L and cylinder C, and this sets up amplified vibrations in the diaphragm B. In applying such a device to the phonograph, if it

is desired to secure amplified reproduction, a phonograph reproducer is connected to the lever D, so as to vibrate the same, while, if it is desired to apply the principle to a recording machine, the diaphragm B is dispensed with and the shoe L is connected to a suitable phonographic recorder. But, at the date of the application for the Higham Patent, April 25th, 1901, this principle had not been developed beyond the domain of experiment.

In fact, it is stipulated in the case (M. R., pp. 33-35) that on August 17, 1900, Higham filed an earlier application for patent, that "the specification and drawings thereof are substantially the same as the specification and drawings of Higham's U. S. Letters Patent No. 678,566," and that on December 8, 1900, the Examiner in charge of the case requested that "practical demonstration of the *operativeness of the device* be made before the Examiner, if the alleged invention has been actually reduced to practice." This indicates very clearly that even to so skilled a person in the art as the Examiner, the operativeness of an amplifying friction reproducer was not only not clear, *but was actually doubted by him.*

As Macdonald states in his testimony to which reference will hereafter be made, it was not until June or July, 1904, that Higham had perfected his devices. These improvements are illustrated in Higham's Patents No. 783,750, February 28th, 1905, and No. 808,052 December 19, 1905. An examination of these patents will show that as compared with the very crude construction of his patent of July 16, 1901 (No. 678,566), Higham's improvements were radical in character and involved the following changes and modifications, among others :

FIRST, a complete reorganization of the friction pads,

SECOND, making the friction wheel of amber, so as to develop a high and very uniform friction,

THIRD, grooving the friction wheel, and determining the proper angle of the groove to give the desired results, and

FOURTH, weighting the friction wheel and allowing it to rest by gravity in the bight formed by the friction pads, so as to automatically secure uniformity of friction. It may be stated positively that without these four radical changes, the Higham friction amplifying devices would never have passed out of the realm of experiment.

Whatever efforts Macdonald may have made, therefore, in 1901, to perfect the Higham apparatus would necessarily be expected to be crude and the evidence shows that this was so and that whatever was done was in the nature of pure experiment. What Macdonald sought to do, and what he describes in his application, is the making of a *reproducing machine* in which the Higham amplifying devices are applied to a graphophone. To this end the friction cylinder of the Higham Patent is mounted on the carriage of a graphophone, and the friction shoe is connected to the diaphragm at one end and at the other end to the reproducing stylus, which engages the record, the idea being that as the stylus is vibrated, the friction will be increased or diminished, and a vibration of the diaphragm will be set up. The means used by Macdonald for continuously rotating the friction cylinder are entirely different from the means used by Edison for rotating the chalk roller of the motograph. Macdonald simply made use of a splined shaft connected to the friction cylinder and driven by a gear, so as to permit it to telescope within the gear, as described in his application. It is not easy to see how, as between two such devices as these of Edison and Macdonald, there could be any interference in fact. One is a recording apparatus and the other essentially a reproducing apparatus. One is largely electrical, and the other entirely mechanical. In one, vibrations result in variations in friction, while in the other, the vibrations are supposed to be due to chemical variations developed on the surface of the chalk cylinder, although no one can say positively that this is the true explanation of the operation of the Edison motograph.

The Office, however, believes that an interference does exist between these two forms of apparatus and the counts of the issue have been so drawn as to apparently apply to the respective structures. Neither party has moved to dissolve.

The Issue.

An analysis of the several counts may be of value in determining just what it is that the parties are here contending for. It is to be observed in the first place that all the counts define the subject matter embodied therein as a "phonic apparatus," which the Office evidently regards as broad enough to include a recording telephone as well as a talking machine.

COUNT 1. This count includes the following elements :

(1) A phonographic recording surface. This is, of course, clearly embodied in the Edison application, but there are grave doubts whether it is disclosed with sufficient definition in the Macdonald application. The only apparatus illustrated by Macdonald is a reproducing apparatus, and although the application states that the invention "relates to machines for *recording* and reproducing sounds", it does not follow that the construction of a recording apparatus would be obvious from the disclosure of the reproducing apparatus. Since with a reproducing apparatus the vibrations of the stylus are amplified at the diaphragm, then, if instead of a reproducing stylus, we made use of a recording stylus, and sounds were impressed on the diaphragm, the vibrations would be obviously *lessened* so that the results would be poorer than if the stylus were connected directly with the diaphragm. In other words, such a device would be a backward step and would be without utility. In order that the Macdonald device might be used as a recording apparatus, it is necessary that the diaphragm should be connected where the reproducing stylus is now connected and

that the recording stylus should be attached where the diaphragm is now located, so that the vibrations of the diaphragm would be amplified and a louder record made. But the application points out no way by which such a change could be effected, and we therefore argue that so far as this element of the issue is concerned the application cannot be regarded even as a constructive reduction to practice. We will point out in consideration of the evidence that Macdonald has not produced a shred of testimony that a machine complying with this requirement of the issue was either conceived or reduced to practice by him.

(2) Means for rotating said surface. This, of course, includes the spring or electric motor of the talking machine, whether the latter is used for recording or reproducing.

(3) A carrier movable across said surface. This includes the usual carriage of the talking machine, by which the recording or reproducing devices are sustained.

(4) A phonograph stylus. Since the issue is specifically limited to a "recording surface," the stylus used must necessarily be a recording stylus and not a reproducing stylus. Macdonald's application in interference does not describe or even refer to a recording stylus, and there is not a word of testimony by Macdonald that he ever experimented with a recording stylus, or made use of the same.

(5) A friction wheel carried by the carrier. This element is the chalk cylinder of the motograph in the Edison application, and the friction cylinder of the Higham amplifying device of the Macdonald application.

(6) A friction member connected to said stylus and pressing against the friction wheel. This is the so-called "pen" or electrode of the motograph in the Edison case, while in Macdonald's application, it is the sectional friction shoe which partially surrounds the friction wheel.

(7) Means representative of sound vibrations for

varying the friction between said friction member and friction wheel. Since the issue, as stated, is specifically limited to recording mechanism the particular means contemplated by this element are difficult to locate. Probably in a recording phonograph, as might, by the exercise of independent invention, be evolved from the special reproducing machine of the Macdonald application, the means would be the recording diaphragm which would be connected to the friction shoe so as to vary the friction between the same and the friction wheel, and which would be responsive to the sound vibrations. With such a device, the only means which would be "representative of sound vibrations" would be the sound waves themselves which, of course, would be too indefinite an element to be included in a specific claim on an apparatus. With a recording telephone like that of the Edison application, the corresponding means would be the electrical devices for varying the friction between the electrode and the chalk cylinder and which are, of course, found in all motographs.

COUNT 2. This count includes the following elements:

- (1) A traveling carriage already considered above.
- (2) A friction wheel and phonograph stylus carried thereby, also considered above.
- (3) A friction member pressing on said wheel and connected to said stylus, also considered above.
- (4) Means for driving said friction wheel. This is the phonograph motor which in both cases also rotates the mandrel. The language is, of course, broad enough to include an independent motor for driving the friction wheel.
- (5) Means representative of sound vibrations for varying the amount of friction between the friction member and friction wheel. Since this count is not specifically limited to a recording device, this particular element is found in the structure of the Macdonald application, in the talking machine record, which communicates its vibrations to the friction pad,

while with the Edison structure, it is comprehended by the electrical devices of the motograph. It will be seen that the second claim is broader than the first in the single respect that it is not limited to a recording device. It is true that the first count is limited to a motor for rotating the record or surface, but this element must necessarily be used, and that the second count is limited to means for driving the friction wheel which must also be necessarily used.

COUNT 3. This count includes the following elements:

(1) A rotating mandrel. This is the support for the record or recording surface of both applications.

(2) A carriage movable longitudinally thereof, considered above.

(3) A phonograph stylus and friction wheel carried by the carriage, considered above.

(4) A friction member pressing on said friction wheel and connected to said stylus, and considered above.

(5) Common driving means for moving the carriage and rotating the friction wheel. This is the driving motor which performs the double function of feeding the carriage across the record or recording surface and of rotating the friction wheel. This latter feature distinguishes the third count from those previously considered, but in other respects the third count may be considered to be identical with the second.

COUNT 4. This count includes the following elements:

(1) A rotating mandrel, considered above.

(2) A carriage movable longitudinally thereof, considered above.

(3) A phonograph stylus and a friction wheel carried by the carriage, considered above.

(4) A friction member pressing on said friction wheel and pressing on said stylus, considered above.

(5) Common driving means for moving the carriage and rotating the friction wheel, considered above.

(6) Means representative of sound vibrations for

varying the friction between the friction member and friction wheel, considered above.

Edison's Case.

In his preliminary statement, the following dates are alleged :

Conception in April, 1902 ;

Successful experiments for the purpose of demonstrating the operativeness and utility of the invention in April, 1902 ;

Sketches illustrating the invention in April, 1902 ;

Explanation to others in April, 1902 ;

Working drawings in May, 1902 ;

Construction of full sized apparatus started May 31st, 1902 ;

Completion of said apparatus in June, 1902 ;

Application filed September 15th, 1905.

These dates are all fully sustained by the testimony. Edison states that " the endeavor to produce a recording telephone arose from the desire on the part of some of the railroad telegraph superintendents to have a system whereby they could change over from the telegraph to the telephone, but they did not want to change unless they had some means of recording all the conversation on the wire, and it was from talking with these superintendents at one of their conventions that I undertook to try and solve the problem " (E. R., p. 27, Q. 7). He says, however, that he has had in mind the combination of a telephone with a phonograph so as to make a permanent record of a telephonic record " ever since the invention of the phonograph " (Q. 8). Some time in 1901, experiments were therefore made to test the feasibility of recording telephonic messages on the phonograph, and to this end complete apparatus was constructed (Edison's Exhibit, First Transmitter, and Edison's Exhibit, First Receiver). The construction of the first apparatus was in charge of John F. Ott (E. R., p. 11, Qs. 6-9) who remembers the trans-

mission of messages from one to the other. With this first apparatus a phonograph record was placed on the mandrel of the transmitting devices, the sounds therefrom were delivered into a transmitting telephone, and were then received by a receiving telephone and delivered to a recording phonograph. The date when the first apparatus was constructed is substantially fixed by the stipulated testimony of John F. Randolph (E. R., p. 23) from which it appears that the charges against the experiment were made between July, 1901, and September, 1901. The itemized statement for this experiment appears in the record as "Edison's Exhibit Extracts Experiment No. 1148" from which it appears that the two telephones used with the apparatus were purchased on August 16, 1901, and that the two Standard phonographs used therewith were purchased on August 29th, 1901. The witness, Ludwig F. Ott, states that the experiments with the first apparatus were made during one of his summer vacations from a school (E. R., p. 7, Q. 4) and that he left school in 1902 (E. R., p. 6, Q. 3). He is sure the experiments were made before he left school (E. R., p. 9, Q. 15). No claim is made that the experiments which were conducted in 1901 embodied the issue of the interference. Those experiments were purely preliminary and were carried on for the purpose of determining the feasibility of recording telephonic messages by means of a phonograph. The experiments were successful and it was then determined to reduce the invention to practical commercial form. As a matter of fact, in the first experiments in 1901, a considerable improvement was made which is thus described by the witness L. F. Ott—"At first I used an ordinary telephone receiver which was mounted over the recorder so that when the message was received over the line it would be delivered to the diaphragm of the recorder and thereby make a record, but I found that such a record was very faint and at Mr. Edison's suggestion therefore the form of receiver at present on the machine was constructed. With this

receiver the diaphragm, which was vibrated by the recording magnet, was connected directly with the recording stylus of the phonograph so that there was less opportunity for mechanical loss and consequently the records made were considerably louder" (E. R., p. 8, Q. 13). Now, in order to make a loud record on a phonograph, it is evident that the telephone receiver should be of such a character as to give the loudest and most distinct reproduction. No instrument would be better suited for this purpose than the well-known Edison chalk receiver, such as is disclosed, for instance, in Edison's Patent No. 811,957 of November 25th, 1879 (Edison's Exhibit, Chalk Receiver Patent). As is well-known, with the chalk receiver or motograph, an electrode connected with the diaphragm is pressed against a rotating chalk cylinder. It was at first believed that the effect of the electrical impulses in passing between the electrode and cylinder was to generate excessively minute gaseous bubbles which varied in friction between the two surfaces. But Mr. Edison evidently does not accept this explanation at the present time, since he states that "the cause of the movement produced by the electric wave is unknown" (E. R., p. 28, Q. 15). Whatever may be the explanation of the phenomena, it is of course a fact that in some way the electric impulses vary the friction between the electrode and the chalk cylinder, so as to cause the diaphragm to vibrate with amplified movement. That a motograph is a common form of telephone, that it is a perfectly operative and successful device, and that it has been well-known to the commercial and scientific world for more than twenty years, are facts of which the Patent Office can properly take judicial notice. One difficulty, however, with the motograph was in securing chalk cylinders, which would give uniform results. Mr. Edison states that "Up to the present time I have been unable to produce a dozen cylinders which would give the same results" (E. R., p. 28, Q. 15), and that

"the chalk, could not be got to give even results, sufficient to make it a commercial success on a railroad telephone line and it was necessary to go into a great deal of experimenting to produce a reliable chalk and such experiments have been continued for many years and are still being made now" (E. R., p. 32, Q. 48). It must not be understood from this evidence that the chalk telephone is not a perfectly operative and commercially successful apparatus, because every one knows that it is. It is a fact, however, that some cylinders operate more successfully than others and with a device that is to be used for railroad signalling, absolute and unqualified certainty of operation is required, since a single mistake with thousands of instruments transmitting perhaps millions of messages might result in accident and loss of life. As stated by the witness F. P. Ott, "Some of them are fair, but they do not seem to be constant; they do not stand up" (E. R., p. 38, Q. 49). Edison's experiments, therefore, which as he states, are still being carried on, were not to make the motograph a commercial success, because it has been a commercial success for twenty years, but to secure an instrument in which the possibility of failure would be absolutely removed. In order to test the particular materials which could be used for the chalk cylinders of the motograph, two separate receivers were made which have been introduced as "Edison's Exhibit, First Chalk Receiver" and "Edison's Exhibit, Second Chalk Receiver." Sketches showing these devices have been introduced (Edison's Exhibit, Sketch of Chalk Receiver) in which various suggestions are made for material out of which to construct the electrodes or pens, and also, two of Mr. Edison's notes (Edison's Exhibit Note No. 1 and Edison's Exhibit Note No. 2) making further suggestions of materials from which to construct the electrodes, and also, numerous suggestions of materials from which to construct the friction cylinders. It is not important in this case as to when these chalk receivers were made, or when these sketches and notes were prepared, as

they do not disclose the issue, but they have been offered merely to illustrate the development of the invention here involved. Mr. Edison's attorney, however, states that he witnessed the operation of "Edison's Exhibit Second Chalk Receiver" on May 9th, 1902 (E. R., p. 27). It seems reasonably clear from the evidence, that the two chalk receivers and the paper exhibits relating to them, were made in April or early in May, 1902.

Edison's Reduction to Practice.

Having satisfied himself by his preliminary experiments with the "First Transmitter," the "First Receiver" and the two "Chalk Receivers," that the recording of telephonic speech by means of a phonograph was perfectly practicable, Edison determined upon the construction of a full-sized, complete apparatus, which is introduced herein (Edison's Exhibit Recording Telephone) and upon which he relies as a reduction to practice of all the counts of the issue. Sketches were first made, the first (Edison's Exhibit Recording Telephone, Sketch No. 1) showing the general outline of the phonograph mandrel, the auxiliary driving cylinder, the friction roller, the worm gearing, the chalk roller, and the electrode pressing thereon; the second (Edison Exhibit Recording Telephone, Sketch No. 2) showing the same parts in little fuller detail and illustrating also the phonograph carriage, the recording device, and the support for the driving shaft, and the third (Edison's Exhibit Recording Telephone Sketch No. 3) illustrating on an enlarged scale, the connection between the motograph and the phonograph recording devices. Although these sketches are somewhat crude, when taken together they illustrate substantially everything that is disclosed in Edison's application. The first two of these sketches are dated May 29th, 1902, while the latter is dated May, 1902. John F. Ott testifies that these

sketches were explained to him by Mr. Edison at least as early as May 29th, 1902, and possibly earlier (E. R., 17, Q. 17). They must have been received by Mr. Ott sometime previous to May 29th, 1902, because on that day, work on the complete machine was started, the order being known as job No. 1283 (E. R., p. 19, Q. 56—E. R., p. 20, Q. 58). The book extracts relating to this work (Edison's Exhibit Book Extracts) have been offered in evidence (E. R., p. 50) from which it appears that the first work on the machine was done during the week ending June 4th, and the final work during the week ending July 30th, 1902. Frederick P. Ott testified that he witnessed the construction of the machine (E. R., p. 40, Q. 70), that it was built in the laboratory (Q. 71) and that "we worked on it for a month I guess" (Q. 74). His attention being called to the fact that the record books show that he was employed on the work from June 4th, 1902, until June 30th, 1902, he states that the machine was constructed during that period (E. R., p. 41, Q. 84). J. F. Ott states that the machine was built "About May, 1902, as near as I now remember" (E. R., p. 16, Q. 40). Mr. Edison says that the machine was built some time in 1902 (E. R., p. 31, Q. 38). Warren testifies that he left the Columbia University in the spring of 1902, entered Mr. Edison's employ at that time, went to work with the Edison Portland Cement Company as electrical engineer, and returned to the Laboratory about September 1st, 1902 (E. R., p. 44, Q. 3). On his return to the Laboratory either in September or October, 1902, he saw the completed machine (E. R., p. 45, Qs. 9-10) which was then in the same form as it is now. The testimony offered by Edison makes it perfectly clear, we think, that the exhibit "Recording Telephone" was constructed in June, 1902, and certainly before September or October of that year. Having constructed the complete machine, a test thereof was not necessary in view of the preliminary tests that had already been made. Edison had deter-

mined the practicability of recording telephone messages on a phonograph and he knew that both a phonograph and a motograph were perfectly operative devices. The only test necessary therefore was to determine the mechanical efficiency of the devices and and this was done. Edison (E. R., p. 31), testifies as follows :

"Q. 39. What, if anything, was done with the machine after it was finished ?

"A. Just tested to see whether the mechanism was all right.

"Q. 40. What kind of a test did you make of it ?

"A. Just ran it back and forward.

"Q. 41. Did you find that it operated satisfactorily ?

"A. Yes ; it operated all right."

Concerning these tests F. P. Ott (E. R., p. 40), testifies :

"Q. 78. After Edison's Exhibit Recording Telephone was constructed, what was done with it ?

A. Turned over to me and we took it down to the Galvanometer Room and ran it and tested it, and as far as the machine went it was all right.

"Q. 79. How did you operate this machine, by hand or by the electric motor in it ?

"A. By the electric motor in it.

"Q. 80. How long did you operate it ?

"A. We ran it for about fifteen or twenty minutes to see everything ran all right.

"Q. 81. How did it work ?

"A. Everything worked all right.

"Q. 82. Did you operate it long enough to cause the carriage to travel one or more times across the mandrel ?

"A. Oh, yes, sir.

"Q. 83. Did you find during this operation that the chalk wheel was turned properly ?

"A. Yes, sir."

The mechanical tests which were thus made were under the circumstances all that were necessary. It was not necessary to test the phonograph nor was it necessary to test the chalk receiver. These devices were of known operativeness and they had already been tested in the preliminary experiments which were made prior to the construction of the complete machine. Furthermore, it will be observed that the exhibit is identical with the Patent Office drawings. In fact, the latter were made from the machine. No question has been raised by the Examiner, nor could any question be raised, by him, as to the operativeness of the device illustrated in the application, and therefore it follows that no question can be raised as to the operativeness of the complete machine. To question the operativeness of the latter device, would be to question the operativeness of the device of the Edison application, which is obviously a matter relating to interference and to applicant's right to a claim and not to a matter of priority of invention. Furthermore, Mr. Warren, who is an electrical engineer, testifies as follows (E. R., p. 45) :

" Q. 13. Did you ever examine this machine from the standpoint of an electrical engineer ?

" A. Yes, sir.

" Q. 14. Is this machine in your opinion an operative machine ?

" A. Yes, sir.

" Q. 15. Are you familiar with the construction and operation of the chalk receiver ?

" A. Yes, sir.

" Q. 16. Have you ever operated the chalk receiver ?

" A. Yes.

" Q. 17. If the machine before us is of such mechanical construction that on the turning of the mandrel the chalk receiver will slowly rotate, do you entertain any doubt if vibrations corresponding to sound waves are received at the electrode

of the chalk receiver, the vibration set up and communicated thus to the recording stylus would be recorded on the phonograph ?

" Question objected to as without sufficient foundation.

" A. No ; there could be no doubt about it."

And, on cross-examination (E. R., p. 56), Mr. Warren says :

" x-Q. 18. Is it your understanding that the exhibit concerning which you have testified, ' Edison Exhibit, Recording Telephone ', is at present in such condition that if connected with telephone wires in circuit and having a blank cylinder on the mandrel, you could thereby record a record on that cylinder ?

" A. (Witness examines the machine carefully). Yes."

After having constructed and sufficiently tested the complete machine, Mr. Edison states that it was set aside (E. R., p. 31, Q. 42) for the purpose of continuing " the experiment with the chalk to produce a commercial application of the motograph principle to the apparatus " (E. R., p. 32, Q. 43). The machine, however, was finished, the invention had been complete and reduced to practice and was a proper subject for a patent application. The Patent Office is certainly familiar with the fact that Mr. Edison is a frequent applicant for patents. He was, in fact, at one time referred to as the " man who kept the steps of the Patent Office hot with his footsteps." He has ample means to file all applications that may be necessary to cover his inventions. Why then, after having completed the machine did Mr. Edison wait until September 15th, 1905, before attempting to patent the same ? He says : " I thought I had applied for a patent. I remember writing out the specifications, and I believe I sent them to New York, but somehow, by change of patent lawyers and

such, I found it was never filed " (E. R., p. 32, Q 44). He testifies :

"Q. 46. When I called your attention to the fact that an application had not been filed on this machine what was done ?

A. I insisted that it was, and I believe a search was made over in New York to find out.

Q. 47. Was the application then filed ?

A. It was then immediately filed, when no record could be found of the previous filing ?"

E. R., p. 32.

In this statement Mr. Edison is corroborated by his attorney, who testifies as follows :

"Shortly before the Edison application was filed, and certainly not earlier than September 1, 1905, I observed in the Galvanometer Room of the Edison Laboratory the piece of apparatus which has been introduced herein as 'Edison's Exhibit, Recording Telephone.' In the Galvanometer Room were a large number of experimental and commercial apparatus, representing part of Mr. Edison's work as an inventor. The exhibit in question was then in the same condition as it is now, and so far as I could see, it appeared to be completely finished and a perfect piece of apparatus. I called Mr. Edison's attention to the exhibit and asked him what it was, and he informed me that it was a recording telephone for the purpose of recording telephone messages on a phonograph, and that the invention was to be used in connection with railroad signalling. I asked him why he had not filed an application for a patent on the device and replied that he had. I informed him that no application had been filed to my knowledge, nor had I ever heard of the apparatus before, but he insisted that he was right, and that the records in my office in New York

would disclose the fact. I thereupon had a search made through the records of my New York firm, Messrs. Dyer & Dyer, 31 Nassau Street, but nothing was found to substantiate Mr. Edison's belief. Mr. Edison explains his failure to file the application to the possible fact that in changing his attorneys the matter may have been overlooked. I came to the Laboratory to take charge of Mr. Edison's work on April 1, 1903. For some months prior to that time Mr. Edison had repeatedly urged me to take charge of his work personally, as he was dissatisfied with having the work done in New York, and I finally consented to do so" (E. R., pp. 47, 48).

From the evidence produced on behalf of Edison, it is submitted that reduction to practice of the invention as early as the summer of 1902 has been shown; that such reduction to practice was effected by the construction of a full-sized, complete and operative device; that having constructed such a device it was Edison's intention to immediately apply for a patent thereon; that by reason of a change in his attorneys that was not done, although he labored under the impression that it had been done; that as soon as the fact was discovered that no application was filed, immediate steps were taken to remedy the omission, and that far from their being any attempt on Edison's part to conceal or suppress the invention or to abandon it to the public, the evidence shows the clearest intent to patent the device, and thereby put the public in possession thereof.

Macdonald's Case.

Particular attention should be directed to Macdonald's preliminary statement, as that is the sworn state of facts to which his case must be restricted. It is not necessary to call attention to any authorities in support of the proposition that a preliminary state-

ment must always be presumed to have been prepared with the utmost care, and that no testimony can be accepted materially at variance therewith. The statement says :

" I conceived the invention specified in the several counts of said interference in the latter part of the year (December) 1900. I cannot fix the date with greater precision. I discussed said invention with others at that time and also during the months of January and February, 1901. During these months I gave instructions for experimental work relating to this type of machine to several of my laboratory assistants and many experiments (relating mainly to the friction devices) were made during the first half of the year 1901. I do not know whether any sketches were made at that time, my recollection being that I communicated my instructions orally. The first complete machine embodying the invention was begun in July, 1901, and completed and tested in August of that year. *This was a reduction to practice of the said invention.* No model, as distinguished from full-sized machines, was made. I began immediately (that is, in August, 1901) to construct a second machine embodying the invention, and in that connection made sketches illustrating certain modifications which I desired to have embodied therein. This was followed by other machines, each embodying some improvements over the preceding constructions, but there being no material change in respect of that part of the invention which is involved in this interference. Work on machines for the market began in the summer of 1904, and since that time a number of such machines have been manufactured and sold in the regular course of business" (M. R., pp. 1-2).

It will be observed from this statement that some facts are alleged emphatically, and others with ap-

parent hesitation. For instance, Macdonald is somewhat uncertain as to the date of conception, but believes it was in December, 1900. He is perfectly certain that during the first half of the year 1901, that is, from January to June, he was engaged in experimenting particularly with the friction devices; he is not certain whether sketches were made, but he believes not. He is absolutely certain that the first complete machine was begun in July, 1901, and finished in August, 1901, and that by this machine the invention was reduced to practice. He is also certain that in August, 1901, he began the construction of a second machine, which was followed by other machines and that work on machines for the market began in the summer of 1904. Now, in the consideration of the Macdonald case we are met with a very significant fact. *He does not prove the construction of the machine on which he relies as reduction to practice; he does not explain why that machine is not produced, and he does not prove the construction of the second machine that was commenced in August, 1901.* On the contrary, we find that Macdonald proofs are limited to experimental apparatus constructed during the first half of the year 1901, as to which no claim of reduction to practice is made and which, according both to the preliminary statement and to Macdonald's testimony, were abandoned experiments. In other words, Macdonald's testimony shows that while he may have conceived the invention prior to Edison, he did not reduce it to practice until long after Edison's reduction to practice, and he has made no attempt to connect his conception with his reduction to practice by a showing of diligence, as is necessary under all the authorities.

Conception.

Macdonald states (M. R., p. 5, Q. 5) that the conception of the invention was the result of the examination of a machine which was shown to him by Daniel

Higham at the office of the Columbia Phonograph Company, about December 1, 1900. Mr. Higham, however, states that he did not show this machine to Macdonald until about July, 1901 (M. R., p. 26, x-Q. 17, x-Q. 18, x-Q. 19). Macdonald's date of conception, is therefore, not corroborated and cannot be accepted.

Macdonald's Exhibit No. 2.

Macdonald states that this exhibit was constructed in December, 1900 (M. R., p. 9, Q. 22), but since this is before any date alleged in the preliminary statement, it cannot be accepted. Furthermore, Macdonald admits that the exhibit is not operative (M. R., p. 12, Q. 43) and nothing appears in the testimony as to what its complete construction may have been. The witness Byrnes, however, testifies that it was "a secondary experiment" (M. R., p. 2, Q. 12).

Macdonald's Exhibit No. 1, 1901 Machine.

Concerning this exhibit, Macdonald states (M. R., p. 6, Q. 5):

"This machine was completed and operated early in the spring of 1901. I fix the date of completion of this machine also by the fact that on the first of May, 1901, there was begun a machinists' strike which lasted about three months. All of my workmen in the Laboratory went out on this strike, which, of course, included the two men who had worked on this machine. The machine, however, was completed and operating for some time before the beginning of this strike."

Osborne states that he saw the exhibit in the early part of 1901 (M. R., p. 15, Q. 4), and that Mr. Plummer commenced work on it in January, 1901. He saw

the machine and heard it operate before the machinists' strike (Q. 20). Byrnes also saw the machine operate before the strike, although he incorrectly fixes the date in 1902 (M. R., p. 21, x-Q. 25). Hinckley saw the machine about September, 1901 (M. R., p. 22, Q. 4) and heard it operate at that time. It seems to be established with reasonable certainty, therefore, that this machine was constructed and operated by Macdonald before the machinists' strike in May, 1901, but it is equally clear that the machine was at best merely an abandoned experiment on which Macdonald can only rely for conception and not a reduction to practice. The reasons for this conclusion will be briefly discussed:

(a) The machine was constructed during the experimental period, namely, "the first half of the year 1901," as set forth in the preliminary statement, and it clearly cannot be the machine which was constructed in July and August of that year, and which was claimed as a reduction to practice of the said invention. If, however, this is the machine that is set out in the preliminary statement as having been constructed in July and August, 1901, it does not so appear from the evidence; no attempt has been made to amend the preliminary statement; and no explanation is offered why an incorrect date was alleged in the preliminary statement. Accepting Osborne's testimony that he saw Plummer working on the machine in January, 1901, there is too much of a discrepancy between that date and July, 1901, when Macdonald states that the machine was started on which he relies for reduction to practice, to assume that the two machines are one and the same. Furthermore, to accept the machine as an abandoned experiment, and not as a reduction to practice, is perfectly consistent with all the facts of the case.

(b) Macdonald states (M. R., p. 6, Q. 8) that the machine "was built from oral instructions, which has been my practice in *experimental work*."

(c) Being asked (M. R. p. 12, x-Q. 44) why he waited

from the time of construction of this exhibit until December 21, 1904, before applying for a patent, Macdonald replied: "The friction device was not of my invention. I had experimented with it considerably *but never succeeded in producing a machine that I considered commercial*, and the devices *were set aside as an uncompleted experiment*; but when Mr. Higham, however, appeared in 1904, with a vastly improved friction device, *I then saw that the commercial problem had been solved. I applied Mr. Higham's new device to my invention of 1900 and 1901 and produced a practical machine*, for which patent was applied for." The attempt to minimize this answer in Macdonald's re-direct examination was entirely ineffective, since the issue does not cover broadly mechanism of rotating the friction device, but relates *specifically* to a phonic apparatus. No clearer admission could possibly be made than that the exhibit was tried and found wanting, and was, therefore, laid aside. It was not until 1904 that Macdonald saw that an operative device could be made, not as a result of his own experiments, but because of Mr. Higham's improvements. *If Higham had never made the improved friction device, the Macdonald machine would still be in the scrap heap.* Possibly, if the machine had been reclaimed from oblivion prior to Edison's reduction to practice and the improvements were then applied to it, could be relied upon as a reduction to practice, but it would be absurd to say that if Higham had not made his improvements even at the present time, but they still existed *in futuro*, Macdonald could years from now hark back to his original experiment, reclaim it from the dust of neglect, and rely upon the machine as so recovered as a reduction to practice *as of its original date.*

(d) The witness Byrnes refers to the fact that "Macdonald's Exhibit No. 2" was a secondary experiment, and the inference is that the exhibit under consideration was also an experiment (M. R., p. 20, Q. 12).

(e) The witness Wilson, referring to the exhibit, states that after the strike he saw certain parts of the machine (M. R., p. 28, Q. 7), from which it would appear that the machine was then dismantled. It is true that the witness later in his deposition (Q. 11) expresses doubt whether he saw the parts of the identical machine or parts of a similar machine, but the testimony is perfectly consistent with Macdonald's statement that the machine was "set aside as an uncompleted experiment."

Macdonald's Exhibit No. 3.

Macdonald does not say when this exhibit was made. Osborne states that he saw Macdonald's Exhibit No. 2, possibly as early as 1902 (M. R., p. 18, re-d. Q. 36), and that he saw Exhibit No. 3 "at the same time" (re-d. Q. 37). This was after Edison's reduction to practice. Byrnes states that he saw Exhibit No. 3 *about* the same time as the other exhibits (M. R., p. 20, Q. 15), but his recollection as to dates is uncertain, since he is positive that the strike in question was in 1902) (M. R., p. 22, x-Q. 27).

Macdonald's Other Experimental Work.

Macdonald states (M. R., p. 8, Q. 19) that in 1902 he constructed a second machine substantially like Exhibit No. 1, but that the machine is not now in existence (Q. 20). No specific date in 1902 being given, the construction of this machine, if material, must be considered as subsequent to Edison's reduction to practice. No corroboration as to the construction of this machine appears in the evidence. From what has already been said concerning Macdonald's work prior to Edison's reduction to practice, it is clear that it represents nothing more than a conception of the invention, even if it goes that far. It is difficult to see how

conception can be based on an uncompleted experiment or how Macdonald can be said to have had a conception of the invention of the issue in 1901 when it was not until 1904, two years after Edison reduced to practice, that Higham appeared with his perfected friction device and made an operative device possible. Also, too much emphasis cannot be laid on the fact that Macdonald has not produced a shred of evidence as to the construction of the machine which he says in his preliminary statement was built in July and August, 1901, and on which he was to rely for a reduction to practice, nor on his failure to produce the second machine, which he states was commenced in August, 1901. The failure of Macdonald to produce such important exhibits or to satisfactorily explain his failure to do so, can have but one interpretation, and that is that if the exhibits had been produced they would necessitate an unfavorable conclusion. Certainly Macdonald goes too far in assuming that the Office will regard as a reduction to practice a machine, or series of machines, constructed during the period of experimenting and which, on MacDonald's own admission, are either fragmentary or were regarded as uncompleted experiments. The best that can be said for Macdonald's case is that these uncompleted, inoperative and abandoned experiments may indicate a very vague conception of the invention some time in 1901. This comprises all of Macdonald's work prior to Edison's reduction to practice. Let us now see when Macdonald reduced the invention to practice and having inquired as to that fact, let us then ascertain if, under the authorities, Macdonald has properly assumed the burden of proof and has connected his conception with his reduction to practice by a showing of reasonable diligence.

Macdonald's Work After Edison's Reduction to Practice.

Macdonald states that the improved Higham devices were brought to his attention in June or July, 1904 (M. R., p. 10, Q. 28), and that he subsequently constructed a machine embodying those improvements (Q. 29), but that the machine is not now in existence (Q. 30). When this machine was constructed does not appear from the evidence. About September 1, 1904, a drawing was made (Macdonald's Exhibit No. 4, Blueprint of 1904, M. R., p. 11, Q. 32), from which the Patent Office drawings were made, the application being filed on December 21st, 1904. The construction of machines for the market was commenced in December, 1904 (Q. 34), but it does not appear whether this was before or after the filing of the application. The making of the drawing of September 1, 1904, is corroborated by the draughtsman, Hinckley (M. R., p. 23, Q. 15). From this review of Macdonald's case the following facts very clearly appear :

(1) Anything that may have been done by Macdonald prior to Edison's reduction to practice was in the nature of abandoned experiments. Possibly, although it is very doubtful, those experiments may be made the basis of a claim to conception.

(2) Macdonald did not reduce to practice until December 21, 1904, when his application was filed.

(3) Granting that the work in 1901 may indicate conception of the invention, nothing was done by Macdonald until September, 1904, more than two years after Edison's reduction to practice. At the date of Edison's entrance on the field, Macdonald was absolutely idle, when, under the authorities he should have been diligent. His early experiments were set aside until Higham could make them complete. Unfortunately for Macdonald, Higham did not complete his work until June or July, 1904, so that the long

period of three years between the construction of the experimental machine and Higham's appearance is entirely unexplained. Under these circumstances, it is not seen how, by any of the well-known rules in interference practice, any conclusion can be reached other than that the award of priority should go to Edison.

POINT 1.

As to the first count, priority must clearly be awarded to Edison.

Edison's recording telephone, both as disclosed in his application and in the complete machine, is a *recording* apparatus and nothing else. The first count is specifically limited to a *recording* surface, and by necessary implication to a *recording* stylus. The exhibit "Recording Telephone" is an actual reduction to practice of the count, and the Edison application a constructive reduction to practice thereof. There is not a word of testimony by Macdonald that he ever had a conception of a recording apparatus within the terms of this count before Edison's reduction to practice, so that Edison stands in the position of the first to conceive and the first to reduce to practice. Macdonald's whole record may be searched in vain for a shred of testimony in support of this count. All, in fact, that Macdonald has to rely upon is the single statement of his application that the invention "relates to machines *recording* and reproducing sounds," but a recording machine is not specifically described, and it has been pointed out that to convert the reproducing machine shown therein to a recording machine, would be a difficult accomplishment and would require independent invention. Not only must Edison be regarded the

first inventor of a machine complying with the limitations of the first count, but as the *only inventor*, since up to the present time Macdonald has produced no evidence on which a claim to inventorship may be based. The vague and general statement in the specification can indicate nothing more than a possibility that the machine might be modified so as to record sounds. Certainly that statement is not sufficient to support a specific claim limited to recording mechanism.

POINT 2.

Macdonald's work in 1901 was purely experimental and was so hopeless that the entire enterprise was laid aside for three years. The invention was completed by Higham. Under these circumstances, the work of 1901 did not even amount to a conception of the invention.

We assert in confidence that if it was not until 1904 that the invention was completed, the abandoned experiments of 1901 cannot be regarded as a sufficiently complete embodiment of the invention to offer a satisfactory basis for a claim to conception. As Macdonald states, the invention was then "uncompleted."

It was not completed until Higham appeared in June or July, 1904. If Higham had never appeared, the invention would presumably never have been completed. The issue necessarily contemplates a completed invention, since the Office, except in caveats, does not recognize inchoate and half-baked schemes. The possibility of a completion of the invention not arising until June or July, 1904, there could have been

no conception of a *complete* invention in 1901, unless we attribute to Macdonald the gift of second-sight and assume that in 1901 he knew what Higham would bring forth in 1904.

In *Mergenthaler vs. Scudder*, 81 O. G., 1417, the Court of Appeals, defining the completeness of a conception of an invention, said :

“ A complete conception as defined in an issue of priority of invention is matter of fact and must be clearly established by proof. The conception of the invention consists in the complete performance of the mental part of the inventive act. All that remains to be accomplished in order to perfect the act or instrument belongs to the department of construction, not invention. It is, therefore, the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice that constitutes an available conception within the meaning of the patent law (1 Rob. on Pats., sec. 375).

They quote with approval the following statement from *Cameron & Everett vs. I. R. Brick*, 1871 C. D., 89 :

“ The point of time at which invention, in such sense as to merit the protection of law, dates is neither when the first thought of it is conceived nor when the practical working machine is completed, but it is when the thought or conception is practically complete ; when it has assumed such shape in the mind that it can be described and illustrated ; when the inventor is ready to instruct the mechanic in relation to putting it in working form ; when the ‘ embryo ’ has taken some definite form in the mind and seeks deliverance, and when this is evidenced by such description or illustration as to demonstrate its completeness. * * *

The true date of invention is at the point where the work of the inventor ceases and the work of the mechanic begins. Up to that point he was inventing, but had not invented, and he must have invented before the law will come to his protection."

See, also, *Herman vs. Fullman*, 107 O. G., 1094, and *Lotterhand vs. Hanson*, 108 O. G., 799.

In this aspect of the case, Edison is the first to conceive and the first to reduce to practice, and, therefore, must prevail.

POINT 3.

Admitting that Macdonald's work in 1901 was a conception of the invention, there is no showing of reasonable diligence connecting that conception with the constructive reduction to practice of December 21, 1904.

It has been shown from Macdonald's own testimony that during the three years between 1901 and June, 1904, absolutely nothing was done by him towards the development of the invention, but that the early experiments were still withheld as uncompleted. During this period, Edison entered the field, conceived the invention, made drawings of it, disclosed it to others and completely reduced it to practice. In this aspect of the case, priority of invention must be awarded to Edison.

POINT 4.

In view of the positive declarations of Macdonald's preliminary statement, his experimental work, prior to May, 1901, cannot be regarded as a reduction to practice. Furthermore, his admission that the early machines were set aside as "an uncompleted experiment" must outweigh any testimony as to their success or operativeness.

The testimony must conform to the preliminary statement. If any other practice is permitted, a preliminary statement becomes a mere idle ceremony. When the preliminary statement says that experiments were made at one period and that the invention was reduced to practice at another period, the construction of machines during the first period and prior to the second period, can only be regarded as part of the experimental work, even if Macdonald had not specifically so characterized them. In *Fowler vs. McBerty*, 125 O. G., 1015, the Court of Appeals said :

"When the Patent Office has refused to allow him to file an amended statement, any attempt to prove the earlier dates is contrary to the rules of the Patent Office and to the general rules applicable to pleading in courts of law. *Such testimony must be disregarded.* Fowler pursued this course and naturally even his testimony, which is within the allegations of his preliminary statement, is very closely scrutinized."

The fact that Macdonald has not attempted to amend his preliminary statement, does not in any way affect the applicability of this doctrine. It would be absurd to say that because he has elected to stand on his preliminary statement as filed, he should be per-

mitted to disregard it, while, if he had attempted to amend the statement and failed, he would be bound by the dates originally alleged by him. Manifestly, if Macdonald seeks to give to the testimony such a color as to support a claim for a reduction to practice on his experimental work of 1901, that testimony must be disregarded. If it is to be regarded at all, it can only be as evidence of conception, and on that point there is grave doubt.

POINT 5.

Even if Macdonald's testimony can be accepted in disregard of his preliminary statement, and if we overlook his admission that his work of 1901 was an abandoned experiment, the 1901 machine (Exhibit No. 1) cannot be regarded as a reduction to practice.

Macdonald admits that it was not until 1904 when Higham produced his improved friction device that his machine became practical enough to warrant filing an application thereon. Whatever may be the construction of the machine at the present time, with the improved attachments, it is clear that in 1901 it was not complete, nor was it so regarded by Macdonald.

In *Swihart vs. Mauldin*, 192 C. D., 137, the issue included a plunger, but contained no limitation as to the material of which it was to be made. Swihart constructed twelve scales with plungers of hard rubber, and they were shipped to customers, tried and returned, as they failed to weigh properly. "After they were returned Swihart learned indirectly from one

Leganke that graphite could be used in making the plungers, and would operate with less friction. He thereupon introduced this feature into his scales and found that they were then satisfactory; but this was after Mauldin had obtained the same information from Leganke and had successfully reduced the invention to practice." Held, under these circumstances that the machines as first constructed by Swihart were not a reduction to practice, but were abandoned experiments. The present case is very similar to *Swihart vs. Mauldin*, because here we have a completion of the invention by the suggestions of Higham, subsequently to Edison's reduction to practice. If Leganke had never suggested to Swihart, or if Swihart had never ascertained that the plungers could be made of graphite, the twelve scales originally constructed by Swihart would never have passed out of the domain of abandoned experiments. So, in the present case, if Higham had never suggested to Macdonald how the friction devices could be made practical, Macdonald's invention would never have been reduced to practice.

In *Gallagher Jr. vs. Hoen*, 115 O. G. 1330, the Court of Appeals, in defining what constitutes reduction to practice, said :

" Nevertheless it is essential that a device to constitute a reduction to practice must show that ' The work of the inventor must be finished physically as well as mentally, Nothing must be left for the inventive genius of the public ' ". (Robinson on Patents, Vol. 1, page 183.)

In *Macdonald vs. Edison*, 105 O. G. 973 (a prior interference between these parties on a different subject matter), the present Commissioner had occasion to refer to an exhibit introduced by Macdonald under the same circumstances as the present 1901 machine. In that case it was claimed that a certain machine was a reduction to practice. The Commissioner said :

"In answer to x Q. 1. Macdonald himself admits that the tests were mere 'laboratory experiments' and that his work on the duplicating-machine was not then pressed. In the last portion of his answer to Q. 30 Macdonald says that the work on the duplicating-machine (the machine in issue) and the recording machine was completed at practically the same time, as the work on both was carried on simultaneously.

In answer to x-Q. 1, it is stated that '*when the two machines were completed* (he received instructions) to lay aside for the time being all work except the getting out of the Grand machine itself * * * and Grand records. The work upon the duplicating-machine was therefore not pressed outside the laboratory experiments.'

"If the duplicating machine was at that time a complete machine capable of successfully performing the work for which it was intended and which needed no further work to be done on it in order to perfect it, there could be no further work for Macdonald to do. It is difficult to see, therefore, how work could be laid aside when it was already completed. The answer to x-Q. 1 raises a presumption that the reduction to practice claimed for Macdonald was not in his own opinion actually complete at that time, for the reason that if there was no more work to be done, there could be no necessity for laying the work aside."

In the present case Macdonald states that the devices were set aside as an uncompleted experiment, so that as the Commissioner in the former case said, it is difficult to see how those devices could be complete, since, if they were complete, there would be no necessity of setting them aside. Yet, if the 1901 machine is to be relied upon as a reduction to practice, it must be shown to have been complete, which Macdonald admits it was not. The former interference shows that Macdonald seems to believe that an uncompleted ex-

periment can be regarded as a reduction to practice. The Patent Office and the Court of Appeals held very distinctly to the contrary, and it is thought that the same holding is applicable to the present case. Certainly, a machine that was deliberately set aside as an uncompleted experiment cannot now be regarded as a complete embodiment of the invention.

POINT 6.

Macdonald may argue that Edison's complete machine cannot be regarded as a reduction to practice, because the machine was not tested except to determine the operativeness of the mechanism for rotating the chalk roller. The reply is that no such tests were necessary under the circumstances.

We have pointed out in the present case that in a broad sense Edison's invention comprises a phonograph and chalk telephone, both of which are perfected devices, and have been known to be such for twenty years. For instance, in Knight's Mechanical Dictionary (Boston, 1884), the chalk telephone is illustrated at Figure 2403, plate XLVIII., and is described on page 883 as follows :

"The chalk cylinder is inclosed in a vulcanite box at the end of the movable arm. The cylinder when once moistened remains in that condition an indefinite time, as the box is practically air tight. The small shaft that runs parallel with the iron arm extends through the side of the box and carries the chalk cylinder. Upon the opposite end there is a small pinion moved by a worm, the crank of which is turned by the finger."

In Appleton's Cyclopaedia of Applied Mechanics (New York, 1885) two forms of motograph are shown in figures 4114 and 4115. The article describing the instrument (page 862) says :

" About the year 1872 Dr. T. A. Edison made the discovery that if a strip of paper, moistened with a chemical solution that is readily decomposed when a current of electricity is passed through it, be drawn over a metal plate connected with the positive pole of a voltaic battery and beneath a platinum style, bearing upon it with a gentle pressure, and which can be connected to the negative pole by means of a key or contact maker, whenever the current is allowed to pass the friction is instantly reduced between the surface of the prepared paper and the platinum style, to be immediately restored the moment the current is again interrupted ; from which it follows that if the paper be drawn with a uniform tractive force below the style, it will slip whenever an electrical current is transmitted through it, and will be retarded again by a fractional resistance the moment that the current ceases to flow. This discovery has been applied by Dr. Edison to the construction of a telephone which is remarkable for the loudness and clearness of its tones. Figure 4114 is a diagram showing the arrangement of the device. The cylinder A is composed of precipitated chalk to which a small proportion of acetate of mercury is added, the whole being moistened with a saturated solution of caustic potash, and moulded into a cylindrical form by being subjected to hydraulic pressure. This cylinder is mounted upon a horizontal axis B, and is made by suitable mechanism to revolve beneath a metallic strip C, which is maintained with a uniform pressure by an adjustable spring S against the surface of the chalk. At the point where the

strip rests upon the cylinder, a small plate of platinum is fastened, and the opposite end of the strip is attached to the centre of a diaphragm of mica D, 4 inches in diameter, firmly fixed in the framing of the instrument by its circumference. By connecting the strip to the zinc element of a voltaic battery, and the chalk cylinder to the copper pole, and rotating the cylinder at a uniform speed away from the diaphragm, it will be found that, when no current is passing, the friction between the moistened surface of the chalk and the platinum strip is sufficient to drag the centre of the diaphragm inward, and it will take up a fixed position of equilibrium when the frictional pull in the centre of the diaphragm is equal to the elastic tension of the strained diaphragm. The moment, however, that an electric current is allowed to pass between the strip and the cylinder, electro-chemical decomposition takes place, the friction between them is reduced, and the diaphragm, finding its elastic tension unopposed, flies back to a second position of equilibrium dependent upon similar conditions; and if a variable or undulatory current of electricity be transmitted through the instrument, the diaphragm will be kept in continual motion by the constantly varying friction existing between the chalk and the platinum, dragging the diaphragm in opposition to its own constant elastic tension."

The form of chalk receiver or motograph above described, is practically identical with the device shown in Edison Patent No. 221,957 of November 25th, 1879, introduced herein. In view of the well recognized operativeness of a phonograph and of a chalk telephone, we submit that if no tests whatever had been made of the complete apparatus they would not be necessary, since it is perfectly evident from an inspection of the machine that when the usual phonographic devices are operated, the chalk cylinder will be turned.

In the case of simple mechanical devices of this kind actual test is not necessary to support a claim for reduction to practice.

In *Mason vs. Hepburn*, 84 O. G. 147, the Court of Appeals said :

“ At the same time, some devices are so simple and their operativeness and efficacy so obvious that the complete construction of one of a size and form intended for and capable of practical use might well yet be regarded as a sufficient reduction to practice without actual use or test in an effort to demonstrate their complete success or probable commercial value.”

In *Herman vs. Fullman*, 107 O. G. 1094, the present Commissioner of Patents said :—

“ The invention here is a mere attachment to automatically turn out the light when it reaches the bottom of the printing frame and is of such a character that it might almost be said that a practical test was not necessary to demonstrate its practicability”.

In *Gallagher. Jr., vs. Hien, supra*, the Court said :

“ Nor is it always essential that actual tests of the invention be made in order to complete the inventive act (*Mason v. Hepburn*). The device relied upon as a reduction to practice must, however, if it has not been worked, clearly be capable of work, and not have been a mere experiment.”

POINT 7.

The tests that were made were sufficient for the purpose. It was not necessary to test the phonograph nor the chalk telephone.

Both Edison (E. R., p. 31, Qs. 391, 40 and 41) and F. P. Ott (E. R., p. 40, Qs. 78-83) testified that after the construction of the machine it was operated to see if it was mechanically efficient, and these tests were successful. That was all that was necessary.

They had already been experimenting with chalk telephones and with recording telephones for more than a year, and they were both familiar with the construction of phonographs and chalk telephones for more than twenty years. To have connected up the telephone and recorded on the phonograph would have been a mere waste of time. There could never be a question about the operativeness of the combination, nor has there been a question about its operativeness; and to hold that the complete machine is not operative would be to declare that a phonograph or a chalk telephone was not an operative device. We do not believe that the Patent Office would undertake the responsibility of so characterizing well-known commercial machines which have been before the public for the past thirty years. Furthermore, the testimony of Warren must not be lost sight of on this point. That witness speaks as an expert and without interest or bias, and he states without qualification, after having carefully examined the complete machine (E. R., p. 46, x-Q. 17-x-Q. 18) that he is familiar with the machine, that it was perfectly operative in October, 1902, and that it is perfectly operative now. Certainly the testimony concerning the operativeness of this machine is sufficient to demonstrate the point, at least *prima facie*, and to impose upon Macdonald the burden of proof of showing that the machine is not operative.

Macdonald has not undertaken to do that, nor in fact, has he ever questioned the successful operativeness of the complete machine, and it is possible that he may not do so. The point is discussed, however, as a matter of precaution.

POINT 8.

Operativeness of the complete machine, even if it has not been proved, would necessarily be presumed from the fact that the machine and the disclosure of the application are identical.

A comparison of Edison's Exhibit Recording Telephone with the drawings of the Edison application will show that the drawings were made from the machine. The Edison application constituting a constructive reduction to practice, it manifestly follows that an identical physical embodiment of the same invention must be an actual reduction to practice. To question the operativeness of the actual embodiment of the invention would carry with it a question of the operativeness of the application. No such question has been raised either by the Patent Office or by Macdonald. Should that question be raised, it would relate not to priority of invention, but to Edison's right to make the claim. A somewhat analogous question raised in *Rolfe vs. Hoffman*, 121 O. G., 1350, where the Court of Appeals said :

"The Patent Office raises no question that Rolfe has fully described an operative device, and when that device shown and described in the application for the patent is substantially the same as the device made in December, 1901, that fact, at least in the present case, is persuasive that the device

belongs to that class of simple devices where it is not essential that actual tests of the invention be made in order to complete the inventive act."

POINT 9.

Edison's prior reduction to practice in 1902, being established, did he by his failure to file an application until 1905 lose his right to the invention in favor of Macdonald, who, in the meantime had constructively reduced to practice?

As to this doctrine, much has been said in recent years, both by the Patent Office and by the Court of Appeals, commencing with *Mason vs. Hepburn*, 84 O. G., 147. In this case the doctrine was announced as follows :

"Considering then this paramount interest of the public in its bearing upon the question as presented here, we think it imperatively demands that a subsequent inventor of a new and useful manufacture or improvement who had diligently pursued his labors to the procurement of a patent in good faith and without any knowledge of the preceding discoveries of another, shall, as against that other, who has deliberately concealed the knowledge of his invention from the public, be regarded as the real inventor and as such entitled to his reward."

In *Thompson vs. Weston*, 1901, C. D., 24, Mr. Commissioner DUELL announced the rule as follows :

"Where an inventor has reduced an invention to practice, applied for and obtained a patent and given the benefit of the invention to the public, a cloud should not be thrown on that patent by giving a *pro forma* award of priority to his rival,

who comes into the Patent Office after seeing the patent and introduces as evidence of his claim to priority, a device made long before the patentees, but kept secret and not given to the public."

And, in the same case on appeal, 1902, C. D. 521, the Court of Appeals held that the facts were squarely within the doctrine of *Mason vs. Hepburn*, and said:

"The particular object of the beneficence of the patent law is the individual who first conceives, and with diligence perfects an invention. And where one has completed the act of invention his right to the reward in the form of a patent becomes complete save in two instances *that may be satisfactorily shown to exist*. First, he loses the right as against the public in general by a public use for the statutory period. Second, by deliberate concealment or suppression of the knowledge of his invention he subordinates his claim, in accordance with the general policy of the law in the promotion of the public interest, to that of another and *bona fide* inventor who during the period of inaction and concealment shall have given the benefit of the discovery to the public. Viewed in the light of 'the true policy and ends of the patent laws,' the latter is the first to invent, and therefore entitled to the reward.

See, also, *Fefel vs. Stocker*, 1901, C. D. 269.

In *Matthes vs. Burke*, 111 O. G. 1363, the doctrine of *Mason vs. Hepburn* was modified to the extent of being applied in a case where both parties are applicants, but where the first to reduce to practice waits "until he learns that his rival is using it commercially and placing the product of such invention on the market." But the rule in its effect was clearly confirmed by the Commissioner in the following terms:

"From the foregoing cases we may extract the principle that an inventor who has completed the

inventive act by reduction of his invention to practice may lose his right to obtain a patent, in favor of a subsequent inventor, by concealment and delay in applying for a patent. An inventor has the power to adopt the secret practice of his invention as his protection instead of the patent monopoly offered by the law to him if he will disclose his invention.

"If he thus refuses to instruct the workers in the art, expecting that secrecy will better serve his private purposes, he may not practice this species of protection indefinitely until it proves insufficient and then avail himself of the protection of that system of patent law which he had tried to replace by other means. By such concealment he has left the field apparently vacant to stimulate the activity of other inventors. After they have relied upon this vacant condition and have by invention supplied the apparent want he cannot defeat them by bringing forward his invention and saying, in effect, that this field is occupied by himself to the exclusion of their rewards for efforts stimulated by the false appearance created by himself. * * *

"The wilfull suppression and concealment of the invention on the part of Matthes for over three years brings his case within the principle stated, and it is held, therefore, that as against Burt he has forfeited his right to a patent."

However much one may doubt the correctness of the view expressed in *Matthes vs. Burt*, which is certainly carrying the doctrine almost to the danger point, the decision in that case fully supports the rule in *Mason vs. Hepburn*, in respect of the two prerequisites that will suffice to defeat the rights of one who actually reduced an invention to practice not in favor of the public as a matter of abandonment, but in favor of his opponent as a matter of priority of invention. These two prerequisites are :

FIRST. That after reducing the invention to practice, it must have been deliberately and intentionally concealed and suppressed, and second, that the filing of the second application must be stimulated by the grant of a patent to his opponent or actual commercial manufacture on the part of the latter. In the present case, we have neither of these features. In the first place, the testimony shows that it was Mr. Edison's intention to file an application for a patent and by the testimony of his attorney he is fully corroborated in this intent. In the second place Macdonald has no patent, and Edison was not stimulated to file his application as a result of Macdonald's commercial operations, but solely because the machine was accidentally discovered by his attorney, and when discovered the application was immediately filed. The doctrine of *Mason vs. Hepburn* is in the nature of a forfeiture, and its harshness should only be invoked in a clear case coming absolutely within its spirit, if not its letter. And, in many cases arising since that decision, the Patent Office and the Court of Appeals have refused to follow the doctrine.

In *Sarfert vs. Meyer*, 1902 C. D., 438, Sarfert, after constructing a singeing machine in March 1898, waited until March 1900, before applying for his patent. The machine was used, not openly, but under no particular injunctions as to secrecy. The Commissioner said that:

"These facts are not such as will bring Sarfert's case within the rule announced in *Mason v. Hepburn*, *supra*. Sarfert, after the reduction to practice of his invention, did not deliberately lay the same aside, nor did he conceal it from the public."

In *Oliver vs. Felbel*, 1902, C. D., 565, Felbel reduced to practice on July 20th, 1898, but did not file his application until December 19th, 1899, after Oliver had put a large number of machines on the market. The

Court of Appeals refused to follow *Mason vs. Hepburn*, and said :

" There was here no fraudulent concealment, no suppression of the invention to keep it from the public, no abandonment of it as of an unsuccessful experiment, no such unreasonable delay as to impose upon the claimant the burden of proof beyond a reasonable doubt. On the contrary, Felbel's delay in this instance does not seem to have been unreasonable under all the circumstances. He had placed his invention in the hands of the person to whom it was most natural for him to look to manufacture it for commercial use, which he was unable to do himself ; and he withdrew it from him as soon as it became apparent to him that this person was not then disposed to take up the matter. He had constructed a practical operative machine ; the reduction to practice had been complete ; and all that remained to be done for the security of his right was to make his application for a patent. Undoubtedly it was possible for him to have done this more promptly than he did ; but the delay was not unreasonable.

" The diligence required of an inventor is diligence rather in the reduction of his invention to practice than in application to the Patent Office or in manufacturing his device for public use. It is very true, as we held in *Mason vs. Hepburn*, *Warner vs. Smith*, and other cases, that delay long and unexplained, and yielding to activity only when the knowledge comes of the entrance of a rival on the field, is always presumptive evidence that what is claimed to have been reduction to practice was no more in fact than an unsatisfactory or abandoned experiment. But when reduction to practice has been satisfactorily shown, and there is no unreasonable or unexplained delay, there is no law that would bar the

first or original inventor of his rights. *In order to give to delay the effect of destroying such a right, there must be some circumstance of concealment, suppression or abandonment of the invention."*

In *McBerty vs. Cook*, 90 O. G., 2295, Cook reduced to practice in 1891 or 1892, but did not file until July 29th, 1896, more than four years afterwards. McBerty on the other hand, had actually reduced to practice in July, 1893, and his original patent was granted August 13, 1895, almost a year before the application of Cook was filed. The Court of Appeals refused to apply the doctrine of *Mason vs. Heburn* on the ground that the delay of Cook in applying for a patent or in making commercial use of his invention was not such an intention to suppress or conceal his invention from the public as would subordinate his right to that of McBerty, who promptly applied for and obtained a patent.

In *Blood vs. Brown*, 105, O. G., 496, Blood reduced to practice in May, 1899, and Brown in the following month. Brown obtained his patent on February 26th, 1901, and Blood filed his application on April 27th, 1901. Here was present apparently all the circumstances of *Mason vs. Heburn*, except deliberate or intentional concealment. The Commissioner of Patents, however, refused to follow the doctrine of that case, because the evidence showed that Blood had made unsuccessful efforts to obtain capital, whereby he might file applications for his inventions. So far as the absence of intent to conceal or suppress the invention is concerned, it is as clear in the present case as in *Blood vs. Brown*. Blood made efforts to file an application and Edison believed he had filed an application.

In *Brooks vs. Hillard*, 106 O. G., 1237, Brooks reduced to practice in April, 1902, and filed his original application two years later on April 26th, 1894, Hilliard in the meantime, having filed his original application on January 3d, 1893. The present Commissioner held that Brooks' intention to file the patent applica-

tion rebutted any presumption of abandonment or concealment and refused to follow *Mason vs. Hepburn*.

Bergger vs. Russel, 121 O. G., 2328, is another case where the Court of Appeals refused to follow the doctrine of *Mason vs. Hepburn*. The syllabus reads :

" Where the reduction to practice of the invention was clearly established, a delay of two and a half years in filing the application therefor is not sufficient to destroy the weight of proof of actual reduction to practice, especially where it appears that drawings showing substantially the same construction as the original device were sent to applicant's attorney more than a year before the application was filed and before any one else had entered the field."

In *Rolfe vs. Hoffman*, *supra*, Hoffman's Patent was issued November 17th, 1903. Rolfe filed his application on December 29th, 1903, but reduced to practice in December, 1901. Here was presented a case which at first glance would appear to come within the doctrine of *Mason vs. Hepburn*, because there was a long delay on the part of the junior applicant, after his reduction to practice, and a patent to his opponent had already issued. Yet the Court again refused to apply the doctrine of *Mason vs. Hepburn*, and said :

"There is absolutely nothing in the record in this case to warrant a finding of abandonment by Rolfe. It appears that Rolfe after making these exhibits, submitted them to his patent attorney, with whom they were left to be patented in their turn; that the American Electric Fuse Company had the right to obtain patents for Rolfe's inventions in the art to which the device in controversy relates, and exercised that right subsequent to December 1, 1901, to the extent of filing about twenty applications; that Rolfe talked more or less about this invention with others, and that he

preserved the exhibits. These facts negative any idea of abandonment of the invention."

Not only do the facts in the present case show, we think beyond any question, that there was no intent or desire on Edison's part to suppress or conceal the invention, which is the first necessary consideration in a case in which the doctrine of *Mason vs. Hepburn* is to be applied, but it does not appear that Edison's application was filed as a result of knowledge of Macdonald's application or of his commercial manufacture. It is stipulated between the parties (M. R., p. 30, 32) that the Macdonald application in this case was involved in a former interference, declared April 25th, 1905, with an application of one Pierman, in which Edison's attorney was also attorney and in which Mr. Edison was interested. Possibly, the argument will be made that this fact was the inciting cause for the Edison application, but no such inference can be drawn under the circumstances, even if it be admitted that the harsh doctrine of *Mason vs. Hepburn* could otherwise be applied. Edison testifies, without qualification, and he is fully corroborated by his attorney, that he had supposed the application was filed, and when it was found that it had not been, the oversight was immediately rectified. This was several months after the Macdonald-Pierman interference was declared. If Edison had deliberately concealed or suppressed his invention, the human thing to have done would have been to file the application when knowledge of the Macdonald application was first obtained, assuming that Edison had *personal* knowledge of that fact, although no proof as to this point is offered. The fact that Edison did not file the application until the machine was called to his attention by his attorney negatives any possible presumption that the inciting cause was the knowledge of Macdonald's application or commercial work. We submit, therefore, as a result of this review of the authorities, that the present case contains none of the features that would warrant the

application of the doctrine of *Mason vs. Hepburn*. When Edison's invention was reduced to practice in 1902, the application for patent could have been filed, and Edison believed it had been filed. The fact that he was in error as to this point, for which an adequate explanation is made, cannot possibly be taken either as an attempt to abandon the invention or to suppress or conceal it. The Edison invention having once been made, the completeness of the inventive act being conceded and the record failing to disclose any attempt to conceal or suppress the same, then under no authority with which we are familiar can an estoppel arise against Edison, and as a result of which Macdonald can rightfully claim priority of invention.

Conclusion.

In conclusion, we submit that Macdonald, although possibly the first to conceive, was not diligent, and in fact has made no attempt to show diligence, in reducing the invention to practice; and that Edison having actually reduced the invention to practice before Macdonald, having had no intent to conceal or suppress the invention, and not having filed his application as a result of the knowledge of Macdonald's application or commercial work, must be regarded as the prior inventor.

Respectfully submitted,

FRANK L. DYER,

For Edison.

Orange, N. J., January 31, 1907.

[31457]

BOX No. 58

O Legal Box 117
Frank L. Roper

Intf No. 25,677, Paper No. 33,

IN THE
United States Patent Office.

EDISON
vs.
MACDONALD. } Interference No. 25,677.

BRIEF FOR MACDONALD.

The application of Macdonald was filed December 21, 1904.

The application of Edison was filed September 15, 1905. Macdonald's Record will be cited herein as "M. R." and Edison's as "E. R."

This interference is the second attempt of the junior party, Edison, to secure, by a contest with the senior party, Macdonald, a patent for the invention in issue. The first attempt was made by Mr. Edison through his employee, Pierman, whose application, No. 249,678, filed March 13, 1905, was put into interference with the present application of Macdonald (See interference being No. 24,676A). That interference was decided on the record in favor of Macdonald, on November 23, 1905, no testimony having been taken on behalf of said Pierman.

Having thus obtained access to Macdonald's file, and to his preliminary statement (Macdonald's files being accessible to his adversary on and after May 19, 1905). Edison filed the application now in interference (see stipulation pages 30-32 M. R.).



Edison's case rests entirely upon the construction of a single apparatus alleged to have been made in May, 1902. This apparatus and its history will be referred to presently. At this point we merely wish to note that the sole explanation given by Mr. Edison of his delay in filing an application for patent on this apparatus is that he thought he had previously applied therefor (E. R., p. 32, Q. 44). Mr. Edison says in the same answer that he remembered writing out the specifications and believed he sent them to his patent attorneys, Messrs. Dyer & Dyer, in New York. No corroboration of this statement is presented. On the contrary, Mr. F. L. Dyer, of that firm, who personally had charge of Mr. Edison's work, testifies that he never saw nor heard of the apparatus until shortly before September 1, 1905, when he casually came across it in one of the rooms of the Edison laboratory (E. R., p. 47). He further states that a search of the records of his New York office was made, "but nothing was found to substantiate Mr. Edison's belief."

It thus appears that the apparatus on which Edison relies for priority had been put aside and dropped out of mind, and that no application for patent was made until Mr. Dyer accidentally stumbled on it in the laboratory, and had the curiosity to ask what it was.

Mr. Dyer had, at that time, full knowledge of Macdonald's application, and of the dates given in his preliminary statement, and the application of Edison was made at his (Mr. Dyer's) instance.

Of course, the attempted explanation of Mr. Edison for his failure to file his application promptly, even if established by the evidence, would be utterly unavailing to avoid the consequences of his delay. Macdonald has all the rights and advantages of the senior applicant, and of one whose opponent did not make an application for patent until after obtaining knowledge of the pendency of his (Macdonald's) application, and of its contents. But the testimony regard-

ing the said apparatus, which shows that it was never used nor even tested for its intended purpose, but was only run backward and forward to see whether the mechanism was all right, and then "was set aside" (Edison, p. 31, Qs. 39-42 incl.), makes it very probable that the failure to apply for a patent was intentional, the whole scheme with which the apparatus was connected having been set aside because (in Mr. Edison's own words)

"one of the necessary parts of the telephone, to wit: the chalk, could not be got to give even results sufficient to make it a commercial success on a railroad telephone line," etc.

It is unnecessary to go further into the evidence for the purpose of disposing of this case. Under well-settled law, the making of a single apparatus which was set aside for over three years, which was never used, which was confessedly incapable of use, and which never has been made capable of use, can not avail to establish priority in favor of a junior applicant, especially when the latter did not file his application until he obtained knowledge of his opponent's application.

Mason vs. Hepburn, 84 O. G. 147.
 Warner vs. Smith, *Id.*, 311.
In re Mower, 88 O. G. 991.
 Thompson vs. Weston, 99 O. G. 864.
 Matthes vs. Burt, 114 O. G. 764.

Under these and other decisions it has become well-settled law that an inventor, even when he has completed the act of invention, may, by concealment or suppression of the knowledge of his invention, forfeit the same to "another and *bona fide* inventor who, during the period of inaction and concealment shall have given the benefit of the discovery to the public."

Thompson vs. Weston, *supra*.

4

MACDONALD'S CASE.

The invention of Macdonald's application relates to a graphophone of a type recently invented by Mr. Daniel Higham, and which is described in his patents No. 678,566, dated July 16, 1901, and No. 783,750, dated Feb. 28, 1905 (M. R., p. 25, Q. 3). In this Higham machine (known commercially as the "Twentieth Century Graphophone") the reproducing point and its diaphragm are combined with a frictional apparatus, whereby the intensity of the acoustical vibrations is greatly increased without distortion of their form. The invention in controversy may be briefly described as consisting in mounting the frictional amplifying device on a movable carrier. In the machine as originally designed by Higham the frictional device was stationary, and it was necessary to move the sound record longitudinally past the frictional device.

The Higham machine was exhibited to Mr. Macdonald about December 1, 1900, and he was instructed to assist the former in developing a commercial machine. Mr. Macdonald says that about this time he conceived the invention in controversy. This conception he embodied in "Macdonald Exhibit 1, 1901, Machine," which was completed and operated early in the spring of 1901 (Macdonald, p. 5, Q. 5; Osborne, pp. 15, 16). This exhibit "is a full-sized operative machine, complete in every detail" (p. 6, Q. 10). Macdonald testifies that this machine was exhibited during 1901 and 1902 to the officials of the American Graphophone Co.; that many sound-records were reproduced on this machine during the years 1901, 1902, 1903, and 1904; and that the machine is still operative (p. 8, Q. 13).

Mr. Byrnes, the laboratory foreman, testifies that he did work on this machine in the year 1901, and that it operated successfully (p. 20, Q. 11). Mr. Hinckley corroborates this (p. 22, Qs. 4-6).

The evidence thus clearly establishes that the invention was complete, operative, and successfully used in the year 1901. If, therefore, Edison's 1902 apparatus had been a successful reduction to practice of the invention, and had not been set aside and concealed for more than three years, Macdonald would nevertheless be entitled to priority on his Exhibit No. 1.

There was no concealment on Macdonald's part, nor any delay nor lack of diligence in following up his invention to the stage of commercial use. He built another machine embodying the invention in 1902; but that machine was not preserved (p. 8, Qs. 19-21).

The development of the frictional amplifying device was in the hands of its inventor, Mr. Higham, who, in June or July, 1904, brought to Mr. Macdonald's notice an improved amplifying device. Thereupon Mr. Macdonald made another machine, embodying the invention in controversy. This machine is represented by "Exhibit No. 4, Blue-print of 1904" (p. 11, Q. 31; Hinckley, p. 23, Qs. 14-17). The patent office drawings were made directly from this blue-print (p. 11, Q. 33).

On Nov. 3, 1904, working drawings were begun from which commercial machines were constructed (p. 11, Qs. 36-38; p. 24, Qs. 20-22). Machines of this type, embodying the invention in controversy, went on the market in December, 1904, and have been sold to the extent of many thousand (p. 12, Q. 38). Apart from the knowledge of Macdonald's application which was gained by Edison's attorney in May, 1905, it will be presumed that knowledge of this new type of graphophone was gained by Mr. Edison very soon after its appearance on the market. This fact further brings the case within the principle of the decisions cited above.

It may be remarked in passing that the Twentieth Century Graphophone is the first talking machine having sound-

augmenting mechanism, and its advent on the market caused a great sensation in the trade.

There was another machine embodying the invention in controversy made by Macdonald prior to Exhibit No. 1 (p. 9, Qs. 23, 24); but in view of the testimony on behalf of Edison, it is unnecessary to refer to this earlier machine (Exhibit No. 2).

Macdonald was thus the first to conceive the invention, the first to reduce it to practice, the first to make application for patent, and the only one of the contesting parties to embody it in an operative and successful mechanism, and to bring it into public use.

EDISON CASE.

The Edison apparatus relied on as evidence of invention by him of the subject matter of this interference was constructed as part of an attempt to make records of telephonic messages. This apparatus is marked "Edison Exhibit Recording Telephone." J. F. Ott testifies that it was constructed under his supervision about May, 1902 (E. R., p. 15, Qs. 37-40). This was about a year after the completion of Macdonald's Exhibit 1901 machine. Ott says nothing as to any use being made of Edison's Exhibit Recording Telephone. The other instruments introduced in connection with Mr. Ott's deposition are not claimed to be embodiments of the invention in controversy.

Mr. Edison testifies with reference to the line of experiments for recording telephonic messages that the device known as the loud speaking telephone "never came into practical use on account of the fact that it was too uncertain, its mode of action being not understood" (p. 28, Q. 12). The device itself ("Exhibit Recording Telephone") was not only an unused and discarded piece of mechanism, but the entire line of experiments of which it was a part came to nothing.

With reference to the "Exhibit Recording Telephone,"
Mr. Edison's testimony (p. 31) is as follows:

"Q. 39. What, if anything, was done with the machine after it was finished?

"A. Just tested to see whether the mechanism was all right.

"Q. 40. What kind of a test did you make of it?

"A. Just ran it back and forward.

"Q. 41. Did you find that it operated satisfactorily?

"A. Yes; it operated all right.

"Q. 42. What was then done with it?

"A. It was set aside."

This does not mean that the machine was operated as a "phonic apparatus," but merely that the carriage supporting the recording mechanism was run back and forth. There was no attempt ever made to record sounds with the device. It never had a single trial.

The testimony of F. P. Ott (p. 40, Qs. 78-83) is substantially to the same effect.

Comment on this testimony is unnecessary. The experiments never reached a point where there was so much as an attempt to record or reproduce sound by means of the Exhibit Recording Telephone. On the contrary, the testimony of the inventor is that immediately after the device was constructed "it was set aside."

It is plain that the only object served by the filing of Edison's interfering application, and by going through the form of taking testimony, is to delay the grant of the patent to Macdonald.

A prompt decision in favor of Macdonald is requested.

Respectfully,

MAURO, CAMERON, LEWIS & MASSIE,

Attorneys for Macdonald.

WASHINGTON, February 8, 1907.

BOX No. 117

Legal Box 117
Frank L. Dyer

United States Patent Office.

EDISON
vs.
MACDONALD.

INTERFERENCE

No. 25,677.

BEFORE THE EXAMINERS-IN-CHIEF.

BRIEF FOR APPELLANT

FRANK L. DYER,
For Edison.

C. G. BURGONNE, Walker and Centre Streets, N. Y.

UNITED STATES PATENT OFFICE

EDISON

VS.

MACDONALD.

Interference No.
25,677. Before
the Examiners-in-
Chief on Appeal.

BRIEF FOR APPELLANT.

The brief before the Examiner of Interferences on behalf of Edison considers the whole case, analyzes and discusses the evidence and reviews the authorities. The decision of the Examiner of Interferences does not affect the entire materiality of that brief at the present time, and therefore a copy of the brief below is bound herewith and made a part hereof. The decision of the Examiner of Interferences makes it necessary to consider only two questions: First, the sufficiency of the Macdonald application as a reduction to practice of the first count of the issue, and second, the sufficiency of Edison's "Recording Telephone" of 1892 as a complete reduction to practice.

I.

Before the Examiner of Interferences it was argued that as to the first count priority should be awarded to Edison, because Macdonald in his application does not disclose an apparatus to which that count can be ap-

plied, nor can the apparatus be modified so as to include the language of that count without further experiment and invention. Apparently the Examiner believes that Edison is estopped from raising this point at this time since he says :

"An examination of the record of this interference shows that Edison failed to make any motion to dissolve on the ground that Macdonald had no right to make this claim, and he is therefore in no position to urge this question at the present time."

Although the Examiner does not cite any authority for his ruling, we assume that he relies on the decisions of the Commissioner in *Clement vs. Brown vs. Stroud*, 125 O. G., 992 (published November 20, 1906) and *Barber vs. Wood*, 127 O. G., 1991 (decided January 26, 1907, and published April 2, 1907).

Attention is directed to the fact that when the doctrine announced in these cases was made public, the testimony in the present interference had already been taken, so that it would have been manifestly impossible to have brought up the matter by a motion to dissolve as the Examiner thinks should have been done.

The practice governing matters of this kind at the time when the interference was declared, appears to have been based on the *Lowry* case, 116 O. G., 2253, and 125 O. G. 2365, in which the Court of Appeals said :

"Whatever right a party to an interference has to contest the right of his adversary to make the interfering claim, such right, if denied, is reviewable, if at all, upon the final decision of the question of priority and such right of appeal as he has to have that question decided is to be considered on the hearing of the statutory appeals allowed from the decision on the question of priority by the Examiner of Interferences."

Following the decisions in the *Lowry* case, the Commissioner, in *Pohle vs. McKnight*, 119 O. G., 2519, decided that the question of the right to make the claim was one of priority, and in *Podlesak & Podlesak vs. MacInmerney*, 120 O. G., 2127, the Court of Appeals said :

"The question of the right of a party to make a claim goes to the very foundation of an interference for if the party has not such right the interference falls. If it be incorrectly held that such party has a right to make the claim priority may be awarded to him and his adversary be deprived of a substantial right in that he is not given a claim where he necessarily is the prior inventor, his adversary never having made the invention. Manifestly that question should not be finally determined by the Primary Examiner who originally declared the interference. We therefore take jurisdiction to determine that question in this case as an ancillary question to be considered in awarding priority of invention."

In *Brown vs. Hodgkinson*, 123 O. G., 2973, the Commissioner said :

"Clearly a party whose right to a patent is denied by the affirmance of another's right to make claims, should be permitted to contest the decision against him through the full course of appeal and *I see no more direct and desirable mode of securing this result than by making the decision one upon priority of invention.*"

See, *Kilbourn vs. Hirner*, 122 O. G., 729; *Wicker vs. Furlong vs. McKee*, 124 O. G., 905, and *McMulken vs. Bollee*, 126 O. G., 1356.

It must be borne in mind that in this case no question is presented as to the necessity of taking testimony bearing on Macdonald's right to make the claim corresponding to the first count. That fact is to be deter-

mined solely on the record here presented. In the former case a logical practice might suggest the desirability of referring to the Primary Examiner the question whether testimony should be taken for the purpose of determining an applicant's right to a claim; just as in a public use proceeding, for example, a reference to the Primary Examiner is made to determine whether a *prima facie* case is presented; but in the present case the practice suggested by the Examiner of Interferences would not only be unnecessary and futile, but directly contrary to the decisions in the *Lowry* and *Podelsak* cases above referred to, and the numerous Patent Office decisions based thereon. In fact such a motion would be no motion at all, because the Court has said that the question of an applicant's right to make a claim *is properly determinable as a matter of priority of invention*. Therefore if the question had been presented to the Primary Examiner, and if the Primary Examiner had held that Macdonald had a right to the claim, the decision would not be final as it necessarily would be in the case of a *bona fide* motion, but would be reviewable on the merits by all the tribunals of the Office.

So far as the merits of the question are concerned they are fully discussed in the brief below, pages 7, 8, 30 and 31.

II.

(a)

As to the merits of the case, it is clear of course that the Macdonald machine of 1901, "Macdonald Exhibit No. 1, 1901 machine" cannot be regarded as a complete reduction to practice. The Examiner of Interferences said, concerning this machine:

"An examination of the testimony, however, fails to make it clear that Macdonald regarded the

machine as a complete and perfected device. It is true he testifies that it was used to demonstrate the practicability of his ideas, but he also testifies that the friction device was of such a character that he did not at that time succeed in producing a machine which he considered commercial, and that 'the devices were set aside as an uncompleted experiment' (x-Q. 44). It was only after Higham in 1904 produced a greatly improved friction device that Macdonald saw the practicability of the invention and again took up the same with the intention of promoting it commercially. In view of this testimony by Macdonald himself, it is obvious that his 1901 machine can only be regarded as an experimental device."

The character of Macdonald's proof concerning this machine and of its effect in this case are fully discussed in Edison's brief below, pages 24-27, 31-33, 34-38. No other conclusion as to the effect of Macdonald's work in 1901 could have been reached. Macdonald deliberately and intentionally abandoned the 1901 machine and did not take up the matter again until Higham appeared on the scene in 1904. Hence it is unimportant whether the Higham machine of 1901 was complete as Macdonald contends or not. A completed invention can be just as effectively abandoned as an uncompleted invention. The only difficulty usually encountered in connection with abandonment is the character of proof of that fact, and in many cases abandonment is presumed in view of the surrounding circumstances, but in the present case we encounter no difficulties whatever, since Macdonald has frankly admitted that it was his intention to abandon the 1901 machine, and that intention was never modified until 1904, when Higham appeared with his completely developed friction devices. If Higham's work had not yet been completed, Macdonald's machine would still be abandoned for aught that appears to the contrary. Under these cir-

cumstances, Macdonald should certainly not be permitted to rely on his 1901 machine as a complete reduction to practice, and the Examiner of Interferences was clearly correct in regarding that machine as merely evidence of conception.

(b)

Macdonald's work in 1901 being properly regarded, as the Examiner of Interferences viewed the matter, as evidence merely of conception, did Edison in 1902, during the period of Macdonald's inaction, independently conceive and reduce the invention to practice?

If it be decided that he did, priority must be awarded to Edison unless it be held under the authority of *Mason vs. Hepburn* and the succeeding cases on the point, that Edison in view of his delay of about three years in applying for the patent, has lost his right to the invention in favor of Macdonald, who in the meantime had constructively reduced it to practice. The authorities on this point are discussed in the brief below, pages 44-52.

(c)

Concerning Edison's "Recording Telephone" on which he relies as a complete reduction to practice of the issue, the Examiner of Interferences said:

"The record clearly shows that this was completed in the summer of the same year (1902).
* * * From Edison's own testimony it is clear that the machine was only tested to see whether it would work mechanically, that is, to ascertain whether the chalk disk could be kept in rotation by the mechanism designed for that purpose. Edison says (Qs. 39 and 40) that it was simply tested to see whether the mechanism was right, and that it was run backward and forward for this purpose. There is no evidence to show that it

was ever tested to see whether it would record speech. In fact it is admitted by Edison that it never was so tested. He contends, however, that no such test was necessary. He states that both the chalk receiver and the phonograph were old and well known instruments and obviously operative. He therefore argues that it was unnecessary to test the machine to ascertain whether the combination of these elements would operate in the manner intended.

"Edison's view of the case cannot be regarded as correct. Such apparatus does not belong to that class of simple inventions which require no test to demonstrate their operativeness. As stated by the Court of Appeals of the District of Columbia in the case of *Macdonald vs. Edison*, 105 O. G., 1263, it is necessary for an inventor to prove that his machine as constructed was capable of successfully performing the work for which it was intended. Inasmuch as Edison failed to make this test, his machine cannot be regarded as a reduction to practice, and can only serve him as evidence of conception."

In *Macdonald vs. Edison*, which is referred to by the Examiner above, the same specific invention was claimed by each party. That invention related to a machine for transferring a phonograph record from one cylinder unto another cylinder. There was no proof that Macdonald had ever successfully operated his machine. It was shown that for the work intended, if there were lost motion of less than one one-thousandth of an inch, the machine would be inoperative. Furthermore, there was the suspicious circumstance in that case, that, after constructing the machine, there was no satisfactory evidence of an attempt to use it, or to explain why it was not used. The invention presented in the present case is of a different character from that of the previous interference between the same parties. Here, so far as Edison is concerned, we

have an ordinary phonograph identically like the phonographs which are made and sold by the thousand every year. The phonograph embodies no new feature but operates just as a phonograph has always operated. Its operativeness is as clearly established as the operativeness of a typewriter or a piano. Why then, should Edison have been put to the absurd necessity of operating a machine which every one knows would operate? Coupled with the phonograph is a telephone, which is equally operative, and any one possessing the slightest pretense to scientific knowledge would know that if a telephone operates in the neighborhood of a phonograph the sounds received by the telephone would be recorded on the phonograph. Furthermore, as is pointed out below, the exact combination of a chalk telephone and a phonograph had been previously used and was of known operativeness, as shown for example in the *Electrical Review* of February 16th, 1899, and the *Telegraphic Journal and Electrical Review* of March 8th, 1889 (page 269). To hold that although the telephone individually considered will receive sound and a phonograph individually considered will record sound, that when the telephone is brought into proximity with the phonograph there is no certainty that the telephone will operate, or that the phonograph will operate, is absurd. It would be just as reasonable to assume that one cannot determine *a priori* that if a cornet is played in the neighborhood of a phonograph the sounds would not be recorded. Yet, the position of the Examiner of Interferences is that although Edison constructed a telephone which he had successfully used for almost thirty years and had constructed a phonograph which he had successfully used for more than twenty-five years, the bringing of those two devices into proximity with one another, raises a doubt as to their successful individual operativeness. So far as the telephone and the phonograph are concerned, there is no mechanical co-operation between them—there is no mechanical connection between the tele-

phone diaphragm and the phonograph diaphragm—the two diaphragms are independent. The telephone diaphragm vibrates under the effect of the sound waves received by the telephone, and the phonograph diaphragm vibrates because of its proximity to the telephone diaphragm. In the experiments of 1901, Edison had conclusively demonstrated that an ordinary Bell telephone was sufficiently powerful to effect a phonographic record of the received sounds. Manifestly a chalk telephone would be better for the purpose and it is for that reason that Edison adopted it. Therefore, as to the operativeness of the combination in a broad sense, we have the following considerations:

FIRST. The recording telephone as constructed in 1902 is the exact counterpart of the device shown and described in the Edison application. No one has raised any question as to the sufficiency of this disclosure or of its operativeness.

SECOND. Common sense shows that the combination must be operative if the individual elements of the combination are operative. No one has raised any doubt as to the operativeness of a chalk telephone or of a phonograph.

THIRD. The electrical publications above referred to show that the combination was known as early as 1889 and that it was perfectly operative even under very unfavorable circumstances. In that case, the telephone diaphragm was separated from the phonograph diaphragm by a space of several inches, but in the present case the two are separated only by a fraction of an inch.

FOURTH. Mr. Warren, the expert witness, testifies without qualification that the machine as examined by him in 1902 and in its present form is perfectly operative (Edison, Rec., p. 46, Q. 17; x-Q. 18).

(d)

If the broad proposition be accepted that an admittedly operative telephone arranged in proximity to

an admittedly operative phonograph will result in the recording of the sounds received by the telephone, then the only question in the case is purely a mechanical one. In other words, was the mechanical construction of the recording telephone of 1902 of such a character that when the phonograph was operated the chalk cylinder of the telephone would be appropriately rotated? That was the only test that Edison was required to make. To do something more might possibly in a special case comply with some arbitrary and artificial rule of law, but it was not necessary in the present case as a matter of common sense. Edison did make the test that he was called upon to make and he did operate the machine so as to demonstrate its mechanical efficiency. We submit that he was required to go no further and that he has done all that an inventor under the law is required to do. Under the circumstances, therefore, we submit that Edison's work of 1902 must be regarded as a complete reduction to practice of the invention, and that entirely aside from the first count, he is entitled to an award of priority. As to the first count, we submit that Macdonald clearly has no right to make that claim, or what amounts to the same thing, he has presented no case of a constructive or actual reduction to practice of that invention, and for this additional reason priority as to the first count should be awarded to Edison.

Orange, N. J., May 28, 1907.

Respectfully submitted,

FRANK L. DYER,
Attorney for Edison.

[32376]

United States Patent Office.

EDISON
vs.
MACDONALD.

Interference No. 25,677.

BEFORE THE COMMISSIONER OF PATENTS.

BRIEF FOR APPELLANT.

FRANK L. DYER,

For Edison.

C. G. BURGYN, Walker and Centre Streets, N. Y.

EDISON

vs.

MACDONALD.

Interference No. 25,677, Phonic
Apparatus.

On Appeal before
the Commissioner
of Patents.

BRIEF FOR APPELLANT.

By the proceedings which have been had in this interference the material questions to be discussed on on this appeal have been reduced to three. The first of these questions relates to Count 1 of the Interference Issue. This is a claim which Edison has clearly the right to make, but Macdonald's application furnishes no disclosure of its subject matter, and Macdonald has therefore no right to make the same. Edison, being the *only* inventor of the invention defined by this claim, is necessarily the first inventor and is therefore entitled to an award of priority as to Count 1. As to the remaining counts of the issue, Macdonald is entitled to the earliest date of conception—1901—but he was not diligent in reducing the invention to practice, his date of reduction to practice being 1904. Edison reduced to practice in 1902 during Macdonald's inactivity, and intended to file his application at that time and thought he had done so, and it was only when he discovered in 1905 that this application had not been filed as he thought, that his application was filed in the Patent Office. The second matter to be

discussed is Edison's reduction to practice, and the third is the delay which occurred between Edison's reduction to practice and the filing of his application.

Edison's Invention.

Edison's invention involved in this interference is an improvement in recording telephones, the idea being to produce an apparatus in which telephonic messages will be automatically recorded on a phonograph. The specific invention, however, is entirely mechanical and of the simplest nature. It resides in the provision of simple mechanical means by which an ordinary motograph or loud speaking telephone is mounted and operated so that it will always speak into the recorder of a phonograph notwithstanding the movement of the latter. Both the phonograph and the motograph are inventions of Mr. Edison, with which the scientific world and the Patent Office have been familiar for more than twenty years. The phonograph comprises essentially a rotating mandrel and a recorder which consists in its essentials of a diaphragm having a cutting stylus connected therewith. In operation a smooth cylindrical blank of wax-like material is placed upon the mandrel and as the blank is rotated the recorder is moved in a direction transverse to the cylinder so that the cutting stylus cuts in the blank a spiral groove, the depth and conformation of which correspond to the vibrations which are imparted to the diaphragm. The motograph or chalk telephone comprises essentially a rotating cylinder made preferably of chalk, which is saturated with an electrolyte, such as a caustic soda solution, a diaphragm and a metallic friction member, which is termed in the record a pen or electrode, connected to the diaphragm and frictionally engaging the chalk cylinder. The telephone current is passed through this friction member and the chalk cylinder, and for some reason, which is unknown, the friction between

the rotating chalk and the friction member varies in accordance with the current passed therethrough, and this variation in the friction produces a corresponding variation in the pull upon the diaphragm by the friction member, so that electric undulations of the telephone circuit are converted into mechanical vibrations of the motograph diaphragm. In a broad sense a phonograph combined with a motograph in such a way that the sound produced by the former will be recorded by the latter is not new, having been successfully demonstrated in this country more than fifteen years ago, as appears from scientific publications in the Patent Office library. See for example, "Electrical Review" (New York) of February 16, 1889, page 4, and the "Telegraphic Journal and Electrical Review" (London) of March 8, 1889, page 269 (Vol. 24, January 24 to June 28, 1889).

The invention on which the Edison application is based, therefore, is not broadly the combination of a phonograph and a chalk telephone, but the specific arrangement wherein the chalk telephone is supported by and moved with the phonograph carriage, so that the diaphragm of the motograph will always occupy the desired close relation with the diaphragm of the phonograph recorder, suitable mechanism being employed to slowly rotate the chalk cylinder of the motograph as the carriage slowly progresses longitudinally of the rotating wax-like cylinder. The specific mechanism described by Edison comprises a drum 28, mounted on the mandrel shaft and engaged frictionally by a roller 29, which connects with the chalk cylinder 30 by means of gearing 31, 32, 33, 34 and 35. In this way the chalk cylinder of the motograph is rotated by the same power that operates the phonograph, the mechanism being such that the chalk cylinder will be turned, notwithstanding its progressive movement with the recorder longitudinally of the phonograph recording cylinder. So far as the Edison invention may, therefore, represent a departure in the art, it resides solely in the mechanism for rotat-

ing the chalk cylinder of the motograph and the mounting of the latter on the carriage of the phonograph. No change is made in the operative principles of either of the two instruments involved; the phonograph is the ordinary phonograph and the motograph the ordinary well-known motograph. The invention is essentially mechanical and of the simplest possible character, and it involves nothing new either in the phonographic or telephonic arts.

Macdonald's Invention.

Macdonald's invention, on the other hand, relates to a much more modern art. It represents Macdonald's efforts to apply the amplifying mechanism invented by Daniel Higham and disclosed in Letters Patent No. 678,566 of July 16, 1901; No. 783,750 of February 28, 1905, and No. 808,052 of December 19, 1905, to a commercial talking machine. Macdonald's apparatus, as shown and described, is an amplifying reproducer for a phonograph; it comprises a grooved friction cylinder 17 mounted upon the moving carriage of the phonograph and traveling therewith, and rotated from the mechanism which operates the phonograph by means of a splined shaft 11, a semi-circular friction shoe 18, made in two parts and pivoted together at 19 and lying in the groove of the friction cylinder, a diaphragm 20, a link 21 connecting the upper end of the friction shoe with the diaphragm, a pivoted floating weight 31, a stylus lever 32 pivoted in the said floating weight and carrying a stylus 23¹, a link 22 connecting the stylus lever to the lower end of the friction shoe 18, and a spring 24 to hold the friction shoe normally against the friction cylinder.

In the operation of this device, the reproducing stylus 23¹ travels in the record groove of the rotating record cylinder, and its movements up and down, caused by the elevations and depressions of the record

groove, are communicated by the link 22, to the friction shoe 18, thus varying the friction between the shoe 18 and the rotating cylinder 17, so that corresponding amplified vibrations are communicated by the link 21 to the diaphragm 20.

The Issue.

COUNT 1. In a phonic apparatus, the combination of a phonographic recording surface, means for rotating said surface, a carrier movable across said surface, a phonographic-stylus and friction wheel carried by the carrier, a friction member connected to said stylus and pressing against the friction wheel, and means representative of sound vibrations for varying the friction between said friction member and friction wheel.

COUNT 2. In a phonic apparatus, the combination of a traveling carriage, a friction wheel and phonographic-stylus carried thereby, a friction member pressing on said wheel and connected to said stylus, means for driving said friction wheel and means representative of sound vibrations for varying the amount of friction between the friction member and friction wheel.

COUNT 3. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic-stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, and common driving means for moving the carriage and rotating the friction wheel.

COUNT 4. In a phonic apparatus, the combination of a rotating mandrel, a carriage movable longitudinally thereof, a phonographic-stylus and friction wheel carried by the carriage, a friction member pressing on said friction wheel and connected to said stylus, common driving means for moving the carriage and rotating the friction wheel, and means representative of sound vibrations for varying the friction between the friction member and friction wheel.

**Macdonald Has Not the Right to Make
the Claim Which is Count 1 of the
Interference Issue.**

It is essential that at this time the terms applied to the wax-like cylinder made use of on phonographs, be clearly understood. When a phonograph is used for recording, a cylinder with a perfectly smooth surface is provided, and in this surface the cutting stylus of the recorder cuts its spiral groove; such a smooth cylinder is known in this art as a blank or record blank, and its surface is termed in the art, a recording surface. After the record groove has been cut or otherwise formed in the cylinder it is known as a record, and its surface is termed a record surface.

There can be no doubt whatever that Count 1 properly describes Edison's invention, and it appears to us to be as clearly evident that this claim does not describe Macdonald's construction. Some of the reasons which lead us to this conclusion are as follows:

(1) The claim is limited to a recording surface: Macdonald's invention as described and shown, is a reproducing apparatus, and the only reference made by Macdonald to a recording mechanism is the general statement at the beginning of his specification that the "invention relates to machines for recording and reproducing sounds." This fact in itself is sufficient to show that Macdonald has no right to make this claim, for since he neither shows nor describes a recording mechanism he certainly cannot properly claim a recording surface which could be used only in connection with such mechanism.

(2) This claim includes a stylus which by necessary implication, as it is to be used on a recording surface, must be a recording or cutting stylus. No such stylus is referred to or shown in the Macdonald application.

(3) If Macdonald were to substitute a cutting stylus for the rubbing stylus 23¹, and a record blank for the record cylinder, and endeavor to make a record by talking against the diaphragm 20, at the same time operating his machine, his device would be inoperative since the link 22 would not be actuated in the direction of its length as would be necessary to operate the cutting stylus to form a proper record groove, but would be moved in a direction at right angles to its length, which motion would have no effect whatever upon the stylus. If possibly by some rearrangement of the friction cylinder and shoe, he *could* obtain a cutting effect, the vibrations of the diaphragm when communicated to the stylus would be lessened and the result would be a record groove in which the depressions and elevations would be *less* than if the cutting stylus were connected directly to the receiving diaphragm, as is the common practice. Such a device instead of marking an advance in the art, would be a step backward.

(4) Perhaps by reorganizing his machine, and attaching the recorder to the link 21 and a sound receiving diaphragm to the link 22, sound could be recorded and an amplified record obtained, but neither the drawing nor the specification gives any hint how such changes could be accomplished, and if Macdonald were to attempt to embody such a disclosure in this application it seems perfectly clear that the Patent Office would refuse to allow such a change to be made as containing new matter. If this matter cannot be embodied in the specification and drawing, it certainly cannot be claimed.

(5) Macdonald's record contains no testimony whatever of any conception on his part, of a recording apparatus, nor of any experiments with such an apparatus nor of any machine containing such an invention.

*The Question of Macdonald's Right to Make this Claim
Should be Determined by the Commissioner in this
Proceeding.*

Both the Examiner of Interferences and the Board of Examiners-in-Chief have said that because Edison has not made a motion for the dissolution of this interference on the ground that Macdonald has not the right to make this claim, the point cannot now be raised here on a hearing to determine priority of invention. In thus holding it is believed that the tribunals below are clearly in error.

The Examiner of Interferences says :

"An examination of the record of this interference shows that Edison failed to make any motion to dissolve on the ground that Macdonald had no right to make this claim, and he is therefore in no position to urge this question at the present time."

And the Board of Examiners-in-Chief say :

"In view of the fact that Edison failed to make any motion to dissolve on the ground that Macdonald had no right to make this claim, he is now precluded *under Rule 130* from urging this point as a ground for a decision in his favor on the question of priority."

It will be noted that the Examiner of Interferences cites no authority whatever for his decision on this point, while the Board of Examiners-in-Chief based their holding upon Rule 130. This rule, which was approved June 12, 1906, and published for the first time in the "Official Gazette" of June 19, 1906, is as follows :

"130. Where the patentability of a claim to an opponent is material to the right of a party to a patent, said party may urge the nonpatentability

of the claim to his opponent at final hearing before the examiner of interferences as a basis for the decision upon priority of invention, and upon appeals from such decision. A party shall not be entitled to take such step, however, unless he has duly presented and prosecuted a motion under Rule 122 for dissolution upon the ground in question, or shows good reason why such a motion was not presented and prosecuted."

As reasons why Edison should be allowed to urge in this proceeding on priority that Macdonald has not the right to make this claim, although no motion to dissolve on this ground was made, we assert:

(a) That Rule 130, the only authority cited either by the Examiner of Interferences or by the Examiners-in-Chief, was made too late to apply.

(b) That the practice in force prior to the adoption of Rule 130 therefore governs, and by such practice a motion for dissolution on this ground was not a prerequisite to the urging of the same on a hearing on priority, but rather the question of right to make the claim was a question of priority only.

(c) That, if in any way this rule could be held to apply, it relates only to motions on *nonpatentability* and not to those based on right to make the claim, and these are separate and distinct motions, and

(d) That under the last clause of Rule 130, Edison has shown good reason for not bringing such a motion, and is therefore entitled to urge this point here.

I.

Rule 130 was made too late to apply to this case.

This rule was not promulgated until June 12, 1906 (published in the "Official Gazette" of June 19, 1906), and this interference was declared on February 6, 1906; the preliminary statement of Edison was approved on March 9, 1906, and the time within which motions for dissolution could be made expired on March 30, 1906, more than two months before the present Rule 130 was approved.

Of course it is well understood that newly made rules govern, so far as they can rationally apply, in cases pending at the time of their adoption, but clearly Rule 130, which relates to motions for dissolution, could not apply to this case when the time within which such motions could be made had expired more than two months before the rule was adopted.

II.

By the practice prior to the adoption of Rule 130, which practice governs in this case, a motion for dissolution on this ground was not made a prerequisite to the urging thereof in a hearing on priority.

As it is clear that Rule 130 was made too late to apply to the present case, which fact was evidently overlooked by the Board of Examiners-in-Chief, the practice which does govern is that found in the prior decisions, as there is nothing of the kind in the earlier rules. The prior practice, based on the decision in the *Lowry* case (116 O. G., 2253,

and 125 O. G., 2365) and the *Podlesak & Podlesak* case 120 O. G., 2127) was that the question of right to make the claim is one of priority, pure and simple, and not dependent in any way upon the making of a motion to dissolve on this ground. See, for example, *Pohle vs. MacKnight* (119 O. G., 2519) decided October 31, 1905, in which it was held that the question of the right to make the claim was one of priority; *Kilbourne vs. Hirner* (122 O. G., 729), decided February 2, 1906, in which the Commissioner held that the right to make the claim is a question properly to be considered in determining priority of invention and in which case no motion for dissolution had been made, and *Brown vs. Hodgkinson* (123 O. G., 2973), decided April 18, 1906, in which the following language occurs :

“ Clearly a party whose right to a patent is denied by an affirmance of another's right to make claims should be permitted to contest the decision against him through the full course of appeal, and I see no more direct and desirable mode of securing this result than by making the decision one upon priority of invention.”

This last decision, it will be noted, was made subsequent not only to the declaration of this interference, but to the time in which motions to dissolve the same might have been made.

There was therefore nothing in the rules or decisions during the period in which motions for dissolution could have been made in this interference which informed appellant that he would have to present a motion on the ground that Macdonald had not the right to make the claim which is count one, before this fact could be urged in a proceeding on priority, but on the contrary there was every reason to believe that this question was viewed by the Patent Office as a question of priority solely and that such a motion, if made, would have been dismissed as premature and unnecessary.

III.

Rule 130 relates to patentability and not to right to make the claim. Motions on these grounds are separate and distinct motions which should not be confused with one another.

Aside from the fact that Rule 130 did not come into existence until six months after the declaration of this interference, and over two months after the expiration of the times in which motion for dissolution could be made, that Rule cannot possibly apply here. The tribunals below have held that appellant is to be deprived of his right to urge that Macdonald has not the right to make this claim because he did not present a motion for the dissolution of the interference under Rule 130, but it will be seen that *this rule is confined exclusively to the question of patentability*. In order to comply strictly with this rule appellant would have been limited to the presentation of a motion to dissolve based on the allegation that the claim was not patentable to Macdonald. While such a proceeding would be a full compliance with this rule, it would not in any way affect the question here presented—right to make the claim—which, it is clearly settled, is a separate and distinct matter from the question of patentability. On this point attention is called to :

Woodward vs. Newton, 86 O. G., 490, C. D. of 1899, p. 13. "The four grounds for dissolution set forth in Rule 122, namely: interference in fact, irregularity, patentability and right to make the claim—have distinct and independent meanings, which should not be confused by parties bringing motions under that rule. * * * The question of patentability of course relates generally to the question as to whether there is a bar to the grant of a patent containing a claim in controversy ;

whereas the question of the right of an applicant to make the claim involves the question whether that particular applicant has a right to claim that invention, aside from any independent or general bar to the grant of a patent covering it—such, for instance, as new matter introduced after the case is on file.”

Kaczander vs. Hodges, 118 O. G., 836: “The four grounds for dissolving interferences mentioned in Rule 122 relate respectively to very different matters and should not be confused with one another.”

See, also, *Owens vs. Richardson, Jr.*, 111 O. G., 1037, to the same effect.

At the time that present Rule 130 was adopted there had been persistent efforts made in many cases to have the questions of patentability and right to make the claim considered in hearings on priority, and it always had been held that the question of patentability would not be so considered, while, on the other hand, as shown, for example, in the cases first cited above, the Commissioner had held that the right of a party to make the claim was a question relating strictly to that of priority. In view of this fact, and the further fact that it had been well established by the decisions that patentability and right to make the claim were distinct and separate matters, when Rule 130 was adopted and it was made to refer specifically to patentability and said nothing at all about the right to make the claim, it appears perfectly clear that it was intended to cover the former case and to exclude the latter.

It is true that there have been recent decisions construing this rule in which it has been held to apply also to the question of right to make the claim, but, independent of the fact that they were made and published too late to guide the appellant in his practice, and are, therefore, inapplicable in the present

case, it is believed that such decisions are erroneous. It is not seen why any different rule of construction should be applied to the Rules of Practice than to claims in applications for patent. If the rules do not fit a particular case which was intended to be covered, or which it was thought they should cover, it is submitted that "they should be amended—not construed" to apply to such a case. The only way in which the construction which has been placed upon Rule 130 can be upheld, is by giving the term "patentability" one meaning in Rule 122—which meaning *excludes* the right to make the claim—and a different meaning in Rule 130—where it *includes* the right to make the claim. Such a construction necessarily will introduce intolerable confusion into the rules, and unjustly punish those who rely on their plain meaning. Rule 130 means what it says, namely, that to urge *non-patentability* at final hearing on priority, a motion to dissolve on that ground must first be brought, and it neither says or means to say anything about right to make the claim. It will not do to say that because it speaks of the "patentability of a claim to an *opponent*" while Rule 122 speaks of "motions * * * which deny the patentability of an *applicant's* claim" instead of an *opponent's* claim, that the first includes the right to make the claim while the last does not, for the "*applicant*" of Rule 122 is the broad term which includes the "*opponent*" of Rule 130, and therefore the language of Rule 122 on this point includes all that is included in Rule 130 and possibly more—certainly not less; while the construction which is necessitated by the position of the Examiners-in-Chief, and some of the recent published decisions (for example, *Barber vs. Wood*, 127 O. G., 1991, decided January 26, 1907) require that the restricted language of Rule 130 shall include the right to make the claim, while the broader language of Rule 122 shall exclude it.

IV.

The last clause of Rule 130 excepts from the operation of the rule those who show good reason for non-compliance therewith.

Finally, Edison's action in this matter is certainly within the provisions of the last clause of this rule. There appears good reason for not presenting and prosecuting a motion of this sort in that, (1) the rule was not in force during the time in which motions for dissolution could be made in this interference; (2) apparently, at least, it had reference to motions on non-patentability, and not to those based on the right to make the claim, which, under the decisions, are different and distinct from the former motions; and (3) the earlier practice which does govern here prescribed no such motion as a prerequisite to urging in this proceeding that Macdonald cannot make this claim.

We submit, therefore, that the question of Macdonald's right to make the claim, which is count 1, is one properly to be considered and determined by the Commissioner on this appeal; that Macdonald has not the right to make this claim, while Edison does have that right; and therefore that Edison, being the only inventor of the invention defined by count 1, must necessarily be the first inventor thereof, and is therefore entitled to an award of priority as to this count.

Priority.

It may be conceded that Macdonald was the first to conceive the invention defined in counts 2, 3 and 4 of the interference issue, as Edison did not conceive this invention until April, 1902, while Macdonald had made in 1901 a machine ("Macdonald's Exhibit 1, 1901 Machine") which is evidence of the conception of this invention. But this machine cannot be considered as a

reduction to practice, nor as showing anything more than conception of the invention. This is perfectly clear from Macdonald's own testimony (M. R., pages 12 and 13):

"x-Q. 44. After having constructed your exhibit, No- 1 machine, why did you wait until December 21, 1904, before applying for a patent ?

"A. The friction device was not of my invention. I had experimented with it considerably, but never succeeded in producing a machine which I considered commercial, *and the devices were set aside as an uncompleted experiment*; but when Mr. Higham, however, *appeared in 1904*, with a vastly improved friction device, I *then* saw that the commercial problem had been solved. *I applied Mr. Higham's new device to my inventions of 1900 and 1901, and produced a practical machine for which patent was applied for.*"

As to this testimony the Examiner of Interferences said :

"It was only after Higham in 1904 produced a greatly improved friction device that Macdonald saw the practicability of the invention, and again took up the same with the intention of promoting it commercially. In view of this testimony by Macdonald himself, it is obvious that his 1901 machine can only be regarded as an experimental device."

Edison's Reduction to Practice.

During this period from 1901 to 1904, while Macdonald was inactive, Edison entered the field in 1902 and reduced the invention to practice by making a complete machine in June of that year (Edison's Exhibit, Recording Telephone), which machine is identi-

cal with the disclosure of Edison's application involved in this interference.

The evidence relating to the tests to which the machine (Edison's Exhibit, Recording Telephone), on which Edison relies for a reduction to practice, was submitted, is as follows :

Edison's testimony (E. R., page 32) :

" Q. 39. What, if anything, was done with the machine after it was finished ?

A. Just tested to see whether the mechanism was all right.

Q. 40. What kind of test did you make of it ?

A. Just ran it back and forward.

Q. 41. Did you find that it operated satisfactorily ?

A. Yes, it operated all right."

Testimony of F. P. Ott (page 40) :

" Q. 78. After Edison's Exhibit, Recording Telephone, was constructed, what was done with it ?

A. Turned it over to me, and we took it down to the galvanometer room and ran it and tested it and as far as the machine went, it was all right. * * *

" Q. 80. How long did you operate it ?

" A. We ran it for about fifteen or twenty minutes to see everything ran all right.

" Q. 81. How did it work ?

" A. Everything worked all right.

" Q. 82. Did you operate it long enough to cause the carriage to travel one or more times across the mandrel ?

" A. Oh, yes, sir.

" Q. 83. Did you find during this operation that the chalk wheel was turned properly ?

" A. Yes, sir."

Both the Examiner of Interferences and the Board of Examiners-in-Chief have decided that these tests

were insufficient to show that Edison's 1902 machine was a reduction to practice. But we believe that in so holding, those tribunals were in error, because of a misconception of the nature of the invention. The invention, as already stated, contemplated nothing new either in the telephonic or phonographic arts. It was entirely a mechanical invention and consisted in so mounting an ordinary motograph that it would move with the phonographic recorder and the diaphragms of the two instruments would always bear the same relation to one another, notwithstanding their movement transversely of the phonograph recording cylinder, and the motograph chalk would be rotated during such movement. That the tests were ample to show the mechanical efficiency of the device cannot possibly be questioned, and since they were coextensive with the invention it would seem that they were all the tests which could reasonably be required. But these tests have been held insufficient because they did not go further; because the motograph was not connected up with a telephone circuit and made to speak into the phonograph recorder and the sounds produced by the motograph recorded upon a phonograph blank. We submit, however, that the tests which were made were sufficient to demonstrate a reduction to practice and for the following reasons, namely :

I.

The tests which were made were all that could reasonably be expected under the circumstances, and all that common sense demanded.

In 1901, the year before he made his complete machine, Mr. Edison, assisted by Mr. L. F. Ott, had com-

ducted a long line of experiments to determine the practicability of recording the sounds produced by a telephone diaphragm upon a phonograph record blank (testimony of L. F. Ott, E. R., pages 6 to 10). In these experiments an ordinary telephone receiver was first made to speak into the recorder of a phonograph, and by this means a record which could be distinguished by means of an ear tube was produced. Later (Q. 13) the recording stylus was connected directly to the telephone diaphragm and a louder record was produced which could be distinguished by means of a horn (Q. 17).

Now in order to make a loud record on a phonograph, which, as is well known, is capable of producing an excellent record of sounds produced by the human voice, no instrument could be better fitted than the Edison loud speaking telephone or chalk receiver, shown for example, in Edison's Patent No. 221,957, dated November 25, 1879 (Edison's Exhibit, Chalk Receiver Patent).

In "Knight's Mechanical Dictionary" (Boston, 1884), the chalk telephone is illustrated at Figure 2403, plate XLVIII., and is described on page 883 as follows :

"The chalk cylinder is enclosed in a vulcanite box at the end of the movable arm. The cylinder when once moistened remains in that condition an indefinite time, as the box is practically air tight. The small shaft that runs parallel with the iron arm extends through the side of the box and carries the chalk cylinder. Upon the opposite end there is a small pinion moved by a worm, the crank of which is turned by the finger."

In Appleton's Cyclopedia of Applied Mechanics (New York, 1885) two forms of motograph are shown in figures 4114 and 4115. The article describing the instrument (page 862) says :

"About the year 1872 Dr. T. A. Edison made the discovery that if a strip of paper, moistened

with a chemical solution that is readily decomposed when a current of electricity is passed through it, be drawn over a metal plate connected with the positive pole of a voltaic battery and beneath a platinum style, bearing upon it with a gentle pressure, and which can be connected to the negative pole by means of a key or contact maker, whenever the current is allowed to pass the friction is instantly reduced between the surfaces of the prepared paper and the platinum style, to be immediately restored the moment the current is again interrupted; from which it follows that if the paper be drawn with a uniform tractive force below the style, it will slip whenever an electrical current is transmitted through it, and will be retarded again by a frictional resistance the moment that the current ceases to flow. *This discovery has been applied by Dr. Edison to the construction of a telephone which is remarkable for the loudness and clearness of its tones.* Figure 4114 is a diagram showing the arrangement of the device. The cylinder A is composed of a precipitated chalk to which a small proportion of acetate of mercury is added, the whole being moistened with a saturated solution of caustic potash, and moulded into a cylindrical form by being subjected to hydraulic pressure. This cylinder is mounted upon a horizontal axis B, and is made by suitable mechanism to revolve beneath a metallic strip C, which is maintained with a uniform pressure by an adjustable spring S against the surface of the chalk. At the point where the strip rests upon the cylinder, a small plate of platinum is fastened, and the opposite end of the strip is attached to the centre of a diaphragm of mica D, 4 inches in diameter, firmly fixed to the framing of the instrument by its circumference. By connecting the strip to the zinc element of a voltaic battery, and the chalk cylinder to the copper pole, and rotating the cylinder at a uni-

form speed away from the diaphragm, it will be found that, when no current is passing, the friction between the moistened surface of the chalk and the platinum strip is sufficient to drag the centre of the diaphragm inward, and it will take up a fixed position of equilibrium when the frictional pull in the centre of the diaphragm is equal to the elastic tension of the strained diaphragm. The moment, however, that an electrical current is allowed to pass between the strip and the cylinder, electro-chemical decomposition takes place, the friction between them is reduced, and the diaphragm, finding its elastic tension unopposed, flies back to a second position of equilibrium dependent upon similar conditions; and if a variable or undulatory current of electricity be transmitted through the instrument, the diaphragm will be kept in continual motion by the constantly varying friction existing between the chalk and the platinum, dragging the diaphragm in opposition to its own constant elastic tension."

The chalk telephone had been previously made use of to produce speech which was recorded upon the phonograph; see for example *Electrical Review* of February 16, 1889, page 4, and *Telegraphic Journal and Electrical Review*, Vol. 24, of March 8, 1889, page 269, which have already been referred to. These publications are on file in the Patent Office Library, so that the Commissioner may take judicial notice of them. They show conclusively that sound produced by a motograph can be recorded upon a phonograph even when the diaphragms of the instruments are several inches apart, whereas in the present case their diaphragms are separated by only a fraction of an inch.

Here we have then, an ordinary phonograph identically like the phonographs which are made and sold by the thousand every year. The phonograph embodies no new feature, but operates just as a phonograph has

always operated. Its operativeness is as clearly established as the operativeness of a typewriter or a piano. Why should Edison have been put to the absurd necessity of operating a machine which everyone knows would operate? Coupled with the phonograph is a telephone which is equally operative, and any one possessing the slightest pretense to scientific knowledge would know that the sounds produced by the telephone when operated in the neighborhood of a phonograph, would be recorded on the phonograph. Furthermore, the publications in the Scientific Library of the Patent Office show that the combination of a chalk telephone and a phonograph had been previously used, and was of known operativeness. To hold that although the telephone, individually considered, will receive sound and a phonograph, individually considered, will record sound, that when the telephone is brought into proximity with the phonograph there is no certainty that the telephone will operate, or that the phonograph will operate, is absurd. It would be just as reasonable to assume that one cannot determine *a priori* that if a cornet is played in the neighborhood of a phonograph, the sounds would be recorded.

When Mr. Edison had finished the machine, "Edison Exhibit, Recording Telephone," he himself evidently was of the opinion that his work, so far as it related to the telephone and phonograph, was completed for he did no further work on it, but intended to apply for a patent on it and thought he had applied for a patent. His subsequent efforts were directed to work on the telephone alone in an attempt to find a motograph chalk, which would give him the absolutely certain results necessary for a device which was to be used in recording railroad signals for which purpose the recording telephone was intended.

In Edison's record, pages 31 and 32, after stating the tests to which the machine was subjected, Mr. Edison continues:

" Q. 41. Did you find that it operated satisfactorily ?

" A. Yes. It operated all right.

" Q. 32. What then was done with it ?

" A. It was set aside.

" Q. 43. For what purpose was it set aside ?

" A. So that I could continue the experiments with the chalk to produce a commercial application of the motograph principles to the apparatus.

" Q. 44. Your application for a patent on this apparatus was not filed until September 15, 1905. Why did you wait so long before applying for a patent after completing the machine ?

" A. Because I thought I had applied for a patent. I remember writing out the specifications, and I believe I sent them to New York, but somehow by change of patent lawyers and such I found it was never filed."

It is not to be understood because of the making of these experiments on motograph chinks that the motograph is not a perfectly operative device, for this device has been well known and has been successfully used for more than twenty years, but the recording telephone was intended to be used for recording railway signals and these experiments were directed to finding a chalk which would give the absolute reliability needed in a device upon which the safety of valuable property and human lives might depend, as would be the case when it was used for this purpose. Naturally Ott, who assisted Mr. Edison in making the experiments on the chinks, would not go to the trouble of testing these chinks upon the motograph connected with a phonograph, but he tested them upon a simple motograph operated by hand, as was much more convenient, and he could tell by ear whether the particular chalk furnished the volume and quality of tone desired.

Mr. Edison and his laboratory assistants are very

busy and eminently practical men. They are never engaged in the pursuit of one thing but that something else is waiting for their attention. Having been for years engaged in the productions of new inventions, they have not the time nor inclination, like the ordinary inventor, all of whose interest is centred in some one device, to delight themselves, hour after hour and day after day, like a child with a new toy, "watching the wheels go round," but the moment one task is completed, the tasks which have hitherto been insistently but unsuccessfully demanding attention, must have their turn. In this case all that Mr. Edison undertook to do was to mount a motograph on a recording phonograph so that the former would move with the phonograph recorder and the motograph chalk would be rotated. The machine, having been constructed and having been found to be operative as designed, nothing further remained to be done on it, and Mr. Edison and his assistants were free to and did turn to something else which was waiting to be done.

Certainly, from the practical and common sense points of view, the tests which were given to the machine, "Edison's Exhibit, Recording Telephone," were ample to demonstrate the reduction to practice of the invention.

II.

In order for Macdonald to prevail it must be held that Edison's application is for an inoperative device.

The recording telephone as constructed in 1902 is the exact counterpart of the device shown in the Edison application for patent. No one has raised any question as to the operativeness of the structure dis-

closed in this application, although it was the duty of the Patent Office to ascertain whether or not it was operative. To raise the question whether the completion of the 1902 machine was a reduction to practice, is to question the operativeness of the identical machine disclosed in the application.

In some cases proof has been required of the operativeness of the device disclosed by an application, and in such cases it has evidently been assumed that its operativeness would not be presumed from the application itself. As a matter of fact in almost all interferences the tangible evidence of actual reduction to practice differs more or less from the constructive evidence shown by the application itself, and consequently it is generally impossible to make a comparison between the disclosure of the application and the actual embodiment of the invention in a machine. But in the present case such a comparison is readily possible because the two are identical. The only case we can find where this situation was actually presented is *Rolfe vs. Hoffman* (121 O. G., 1350), in which the Court of Appeals held substantially that the constructive reduction to practice by filing of the application relates back to the completion of a device identical with the application as filed, saying

"The Patent Office raises no question that Rolfe has fully described an operative device, and when that device shown and described in the application for the patent is substantially the same as the device made in December, 1901, that fact, at least in the present case, is persuasive that the device belongs to that class of simple devices where it is not essential that actual tests of the invention be made in order to complete the inventive act."

Not only was there no question raised by the Patent Office of the operativeness of the device disclosed in Mr. Edison's application (the disclosure in which

is identical with the machine, "Edison's Exhibit, Recording Telephone"), but neither has Macdonald moved to dissolve the interference on the ground of alleged inoperativeness of the machine disclosed in the Edison application, nor in any other way shown or even asserted that this application was for an inoperative device, nor has Macdonald questioned the obvious fact that the machine and the disclosure of the application are identical. The presumption that the Edison application is for an operative device, and therefore that the constructive reduction to practice, resulting from the filing of an allowable application, relates back to the time of making the 1902 machine, which is identical with the disclosure of the application (*Rolfe vs. Hoffman, supra*), has now become a certainty because of Macdonald's failure to assert and prove the contrary.

In *Bowditch vs. Todd*, C. D. of 1904, page 415, Bowditch had asserted and attempted to prove that Todd's device was inoperative. The Commissioner said :

"A large portion of Bowditch's testimony was taken for the purpose of showing that Todd's machine as described and claimed in his application, is inoperative. If it is, in fact, inoperative, it follows that Todd would not be entitled to the benefit of a constructive reduction to practice on the date that he filed his application, for it is necessary that the application to have such effect must be an allowable application and to constitute an allowable application the machine described and claimed therein must be an operative machine.

"The presumption that the machine is operative is in favor of Todd and this presumption is increased by the concurrent decisions of the Examiner of Interferences and the Examiners-in-Chief which hold that Bowditch has failed to show that the device described and claimed by Todd in his application is inoperative. * * * The presumption in favor of the operativeness of

Todd's device has not been overcome by the evidence presented by Bowditch. On the contrary this favorable presumption becomes almost a certainty in view of the testimony presented in behalf of Todd."

We submit that to hold that the machine, "Edison's Exhibit, Recording Telephone," which was completed in 1902, was not a reduction to practice of the invention, at the time of its completion, it will be necessary to hold that the machine of the Edison application, which is identically the same as the 1902 machine, is inoperative. But inasmuch as, under the decisions, the machine disclosed in this application cannot be held to be inoperative, because of the presumption of operativeness resulting from the filing of an allowable application, which presumption has not been overcome either by the question of operativeness being raised by the Patent Office or by any proof or even assertion on the part of Macdonald, it is equally true that the machine must be regarded as a reduction to practice at the time of its completion in 1902, and Mr. Edison, having been the first to reduce to practice, must therefore be the first inventor.

III.

Mr. Warren, the electrical expert, testifies that Edison's 1902 machine is operative.

Mr. Warren, the electrical engineer and expert witness, testifies without qualification that the machine, as examined by him in 1902, and in his present form, is perfectly operative (E. R., page 45) :

" Q. 13. Did you ever examine this machine from the standpoint of an electrical engineer ?

" A. Yes, sir.

" Q. 14. Is this machine in your opinion an operative machine?

" A. Yes, sir.

" Q. 15. Are you familiar with the construction and operation of the chalk receiver?

" A. Yes, sir.

" Q. 16. Have you ever operated the chalk receiver?

" A. Yes.

" Q. 17. If the machine before us is of such mechanical construction that on the turning of the mandrel the chalk receiver will slowly rotate, do you entertain any doubt if vibrations corresponding to sound waves are received at the electrode of the chalk receiver, the vibration set up and communicated thus to the recording stylus would be recorded on the phonograph?

" Question objected to as without sufficient foundation.

" A. No; there could be no doubt about it."

And on cross-examination (E. R., p. 46), Mr. Warren says:

" x-Q. 18. Is it your understanding that the exhibit concerning which you have testified, "Edison's Exhibit, Recording Telephone," is at present in such condition that if connected with telephone wires in circuit and having a blank cylinder on the mandrel, you could thereby record a record on that cylinder?

" A. (Witness examines the machine carefully) Yes."

IV.

No test is necessary in the case of simple devices.

In view of the well-recognized operativeness of a phonograph and of a chalk telephone, we submit that if no tests whatever had been made of the complete apparatus, they would not be necessary, since it is perfectly evident from an inspection of the machine that when the usual phonographic devices are operated, the chalk cylinder will be turned. In the case of simple mechanical devices of this kind actual test is not necessary to support a claim of reduction to practice.

In *Mason vs. Hepburn*, 84 O. G., 147, the Court of Appeals said :

" At the same time some devices are so simple and their purpose and efficacy so obvious that the complete construction of one of a size and form intended for and capable of practical use might well be regarded as a sufficient reduction to practice without actual use or test in an effort to demonstrate their complete success or probable commercial value."

In *Herman vs. Fullman*, 107 O. G., 1094, the Commissioner of Patents said :

" The invention here is a mere attachment to automatically turn out the light when it reaches the bottom of the printing frame, and is of such a character that it might almost be said that a practical test was not necessary to demonstrate its practicability."

In *Gallagher, Jr., vs. Hein*, 116 O. G., 1330, the Court said :

" Nor is it always essential that actual tests of the invention be made in order to complete the in-

ventive act (Mason vs. Hepburn). The device relied upon as a reduction to practice must, however, if it has not been worked, clearly be capable of work and not have been a mere experiment."

V.

Doctrine of Macdonald vs. Edison, 105 O. G., 1263, not applicable to this case.

Macdonald vs. Edison, 105 O. G., 1263, is the principal decision which has been relied upon as an authority for the proposition that the tests to which Edison's 1902 machine was subjected were insufficient. In that case the same specific invention was claimed by each party. That invention related to a machine for transferring a phonograph record from one cylinder to another cylinder, which was substantially a new art. There was no proof that Macdonald had ever successfully operated his machine. It was shown that in the work intended if there were lost motion of less than one one-thousandth of an inch the machine would be inoperative. Furthermore, there was the suspicious circumstance in that case that after constructing the machine there was no satisfactory evidence of an attempt to use it or to explain why it was not used.

The present case is very different from the former interference between the same parties. Mr. Edison's invention, which is involved in the present interference, is only a simple mechanical improvement in old and well-known machines. After the machine was completed it was actually submitted to all the mechanical tests which were necessary or desirable from the practical and common sense standpoints, and the reasons for not pushing the machine commercially have been fully explained.

Edison's Prior Reduction to Practice in 1902 Being Established, Did He, by His Failure to File an Application Until 1905, Lose His Right to the Invention in Favor of Macdonald, Who in the Meantime Had Constructively Reduced to Practice?

As to this doctrine, much has been said in recent years both by the Patent Office and by the Court of Appeals, commencing with *Mason vs. Hepburn*, 84 O. G., 147. In this case the doctrine was announced as follows :

" Considering, then, this paramount interest of the public in its bearing upon the question as presented here, we think it imperatively demands that a subsequent inventor of a new and useful manufacture or improvement who had diligently pursued his labors to the procurement of a patent in good faith, and without any knowledge of the preceding discoveries of another, shall, as against that other, who has deliberately concealed the knowledge of his invention from the public, be regarded as the real inventor, and as such entitled to his reward."

In *Thompson vs. Weston*, C. D. of 1901, page 24, Commissioner DUELL announced the rule as follows :

" Where an inventor has reduced an invention to practice, applied for and obtained a patent and given the benefit of the invention to the public, a cloud should not be thrown on that patent by a *pro forma* award of priority to his rival, who comes into the Patent Office after seeing the patent and introduces as evidence of his claim to priority, a device made long before the patentee's, but kept secret and not given to the public."

And in the same case on appeal, 1902, C. D. 521, the Court of Appeals held that the facts were squarely within the doctrine of *Mason vs. Hepburn*, and said :

"The particular object of the beneficence of the patent law is the individual who first conceives and with diligence perfects an invention. And where one has completed the act of invention his right to the reward in the form of a patent becomes complete save in two instances *that may be satisfactorily shown to exist*. First, he loses the right as against the public in general by a public use for the statutory period. Second, by deliberate concealment or suppression of the knowledge of his invention he subordinates his claim, in accordance with the general policy of the law in the promotion of the public interest, to that of another and *bona fide* inventor who during the period of inaction and concealment shall have given the benefit of the discovery to the public. Viewed in the light of 'the true policy and ends of the patent laws,' the latter is the first to invent, and therefore entitled to the reward."

In *Matthes vs. Burt*, 111 O. G., 1363, the doctrine of *Mason vs. Hepburn* was modified to the extent of being applied in a case where both parties are applicants, but where the first to reduce to practice waits "until he learns that his rival is using it commercially and placing the product of such invention on the market." But the rule in its effect was clearly confirmed by the Commissioner in the following terms :

"From the foregoing cases we may extract the principle that an inventor who has completed the inventive act by reduction of his invention to practice may lose his right to obtain a patent, in favor of a subsequent inventor, by concealment and delay in applying for a patent. An inventor has the power to adopt the secret practice of his in-

vention as his protection instead of the patent monopoly offered by the law to him if he will disclose his invention.

"If he thus refuses to instruct the workers in the art, expecting that secrecy will better serve his private purposes, he may not practice this species of protection indefinitely until it proves insufficient and then avail himself of the protection of that system of patent law which he had tried to replace by other means. By such concealment he has left the field apparently vacant to stimulate the activity of other inventors. After they have relied upon this vacant condition and have by invention supplied the apparent want he cannot defeat them by bringing forward his invention and saying, in effect, that this field is occupied by himself to the exclusion of their rewards for efforts stimulated by the false appearance created by himself. * * *

"The wilful suppression and concealment of the invention on the part of Matthes for over three years brings his case within the principle stated, and it is held, therefore, that as against Burt he has forfeited his right to a patent."

See, also,

Fefel vs. Stecker, C. D. of 1901, page 269.

Moore vs. Hewitt, 125 O. G., 2047.

Bliss vs. McElroy, 128 O. G., 458.

Richards vs. Burkbolder, 128 O. G., 2533.

All the decisions in this line of cases are in agreement in respect of the two prerequisites that will suffice to defeat the rights of one who actually reduced an invention to practice, not in favor of the public as a matter of abandonment, but in favor of his opponent as a matter of priority of invention. These two prerequisites are :

FIRST. That after reducing the invention to practice, it must have been deliberately and intentionally concealed and suppressed, and

SECOND. That the filing of the second application must be stimulated by the grant of a patent to his opponent or actual commercial manufacture on the part of the latter.

In the present case, we have neither of these features. In the first place, the testimony shows that it was Mr. Edison's intention to file an application for a patent, and by the testimony of his attorney he is fully corroborated in this intent (E. R., p. 47). In the second place Macdonald has no patent, and Edison was not stimulated to file his application as a result of Macdonald's commercial operations, but solely because the machine was accidentally discovered by his attorney, and when discovered the application was immediately filed. The doctrine of *Mason vs. Hepburn* is in the nature of a forfeiture, and its harshness should only be invoked in a clear case coming absolutely within its spirit, if not its letter. And, in many cases arising since that decision, the Patent Office and the Court of Appeals have refused to follow the doctrine.

In *Sarfert vs. Meyer*, C. D. of 1902, page 438, Sarfert, after constructing a singeing machine in March, 1898, waited until March, 1900, before applying for his patent. The machine was used, not openly, but under no particular injunctions as to secrecy. The Commissioner said that :

"These facts are not such as will bring Sarfert's case within the rule announced in *Mason v. Hepburn*, *supra*. Sarfert, after the reduction to practice of his invention, did not deliberately lay the same aside, nor did he conceal it from the public."

In *Oliver vs. Felbel*, C. D. of 1902, p. 565, Felbel reduced to practice on July 20th, 1898, but did not file his application until December 19th, 1899, after Oliver had put a large number of machines on the market. The Court of Appeals refused to follow *Mason vs. Hepburn*, and said :

"There was here no fraudulent concealment, no suppression of the invention to keep it from the public, no abandonment of it as of an unsuccessful experiment, no such unreasonable delay as to impose upon the claimant the burden of proof beyond a reasonable doubt. On the contrary, Felbel's delay in this instance does not seem to have been unreasonable under all the circumstances. He had placed his invention in the hands of the person to whom it was most natural for him to look to manufacture it for commercial use, which he was unable to do himself; and he withdrew it from him as soon as it became apparent to him that this person was not then disposed to take up the matter. He had constructed a practical operative machine; the reduction to practice had been complete; and all that remained to be done for the security of his right was to make his application for a patent. Undoubtedly it was possible for him to have done this more promptly than he did; but the delay was not unreasonable.

"The diligence required of an inventor is diligence rather in the reduction of his invention to practice than in application to the Patent Office or in manufacturing his device for public use. It is very true, as we held in *Mason vs. Hepburn*, *Warner vs. Smith*, and other cases, that delay long and unexplained, and yielding to activity only when the knowledge comes of the entrance of a rival on the field, is always presumptive evidence that what is claimed to have been reduction to practice was no more in fact than an unsatisfactory or abandoned experiment. But when reduction to practice has been satisfactorily shown, and there is no unreasonable or unexplained delay, there is no law that would bar the first or original inventor of his right. *In order to give to delay the effect of destroying such a right, there must be some circumstance of concealment, suppression or abandonment of the invention.*"

In *McBerty vs. Cook*, 90 O. G., 2295, Cook reduced to practice in 1891 or 1892, but did not file until July 29th, 1896, more than four years afterwards. McBerty, on the other hand, had actually reduced to practice in July, 1895, almost a year before the application of Cook was filed. The Court of Appeals refused to apply the doctrine of *Mason vs. Hepburn* on the ground that the delay of Cook in applying for a patent or in making commercial use of his invention was not such an intention to suppress or conceal his invention from the public as would subordinate his right to that of McBerty, who promptly applied for and obtained a patent.

In *Blood vs. Brown*, 105 O. G., 496, Blood reduced to practice in May, 1899, and Brown in the following month. Brown obtained his patent on February 26th, 1901, and Blood filed his application on April 27th, 1901. Here was present apparently all the circumstances of *Mason vs. Hepburn* except deliberate or intentional concealment. The Commissioner of Patents, however, refused to follow the doctrine of that case, because the evidence showed that Blood had made unsuccessful efforts to obtain capital whereby he might file applications for his inventions. So far as the absence of intent to conceal or suppress the invention is concerned, it is as clear in the present case as in *Blood vs. Brown*. Blood made efforts to file an application and Edison believed he had filed an application.

In *Brooks vs. Hilliard*, 106 O. G., 1237, Brooks reduced to practice in April, 1902, and filed his original application two years later, on April 26th, 1894, Hilliard in the meantime, having filed his original application on January 3d, 1893. The Commissioner held that Brooks' intention to file the patent application rebutted any presumption of abandonment or concealment, and refused to follow *Mason vs. Hepburn*.

Seeberger vs. Russel, 121 O. G., 2328, is another case where the Court of Appeals refused to follow the doctrine of *Mason vs. Hepburn*. The syllabus reads :

"Where the reduction to practice of the invention was clearly established, a delay of two and a half years in filing the application therefor is not sufficient to destroy the weight of proof of actual reduction to practice, especially where it appears that drawings showing substantially the same construction as the original device were sent to applicant's attorneys more than a year before the application was filed and before anyone else had entered the field."

In *Rolfe vs. Hoffman*, *supra*, Hoffman's patent was issued November 17th, 1903. Rolfe filed his application on December 29th, 1903, but reduced to practice in December 1901. Here was presented a case which at first glance would appear to come within the doctrine of *Mason vs. Hepburn*, because there was a long delay on the part of the junior applicant, after his reduction to practice, and a patent to his opponent had already issued. Yet the Court again refused to apply the doctrine of *Mason vs. Hepburn*, and said :

"There is absolutely nothing in the record in this case to warrant a finding of abandonment by Rolfe. It appears that Rolfe after making these exhibits, submitted them to his patent attorney, with whom they were left to be patented in their turn; that the American Electric Fuse Company had the right to obtain patents for Rolfe's inventions in the art to which the device in controversy relates, and exercised that right subsequent to December 1, 1901, to the extent of filing about twenty applications; that Rolfe talked more or less about this invention with others, and that he preserved the exhibits. These facts negative any idea of abandonment of the invention."

Not only do the facts in the present case show, we think beyond any question, that there was no in-

tent or desire on Edison's part to suppress or conceal the invention, which is the first necessary consideration in a case in which the doctrine of *Mason vs. Hepburn* is to be applied, but it does not appear that Edison's application was filed as a result of knowledge of Macdonald's application or of his commercial manufacture. It is stipulated between the parties (M. R., pp. 30, 32) that the Macdonald application in this case was involved in a former interference, declared April 25th, 1905, with an application of one Pierman, in which Edison's attorney was also attorney and in which Mr. Edison was interested. Macdonald argues that this fact was the inciting cause for the Edison application, but no such inference can be drawn under the circumstances, even if it be admitted that the harsh doctrine of *Mason vs. Hepburn* could otherwise be applied. Edison testifies, without qualification, and he is fully corroborated by his attorney, that he supposed the application was filed, and when it was found that it had not been, the oversight was immediately rectified (E. R., p. 47). This was several months after the Macdonald-Pierman interference was declared. If Edison had deliberately concealed or suppressed his invention, the human thing to have done would have been to file the application when knowledge of the Macdonald application was first obtained, assuming that Edison had *personal* knowledge of that fact, although no proof as to this point is offered. The fact that Edison did not file the application until the machine was called to his attention by his attorney negatives any possible presumption that the inciting cause was the knowledge of Macdonald's application or commercial work. We submit, therefore, as a result of this review of the authorities, that the present case contains none of the features that would warrant the application of the doctrine of *Mason vs. Hepburn*. When Edison's invention was reduced to practice in 1902, the application for patent could have been filed, and Edison believed it had been filed. The fact that he was in error as to this point, for

which an adequate explanation is made, cannot possibly be taken either as an attempt to abandon the invention or to suppress or conceal it. On this point the Examiners-in-Chief say :

"In excuse for this delay of more than three years Edison alleges that he thought that he had filed an application covering this machine, and it was not until his attorney chanced to see the machine where it had been laid aside and questioned him about it that he was aware that no patent had been applied for. This excuse is insufficient. It seems improbable that an inventor familiar as was Edison with the advisability of proceeding with diligence in applying for patents would have permitted an invention of which he recognized the importance to pass from his mind so completely as to permit a period of three years to expire without making any inquiry as to whether an application had been filed or not. His conduct of itself raises a suspicion that he did not believe that he had made a successful reduction to practice of the invention."

The sufficient answer to this, which is, of course, no more than a mere conjecture, is that save for exceptional cases in which peculiar questions arise, when Mr. Edison files an application for a patent, he neither hears nor knows anything about it till it has become a patent or a patent has been finally denied.

The Edison invention having once been made, the completeness of the inventive act being conceded and the record failing to disclose any attempt to conceal or suppress the same, then under no authority with which we are familiar can an estoppel arise against Edison, as a result of which Macdonald can rightfully claim priority of invention.]

Conclusion.

In conclusion we submit that Macdonald has no right to make the claim which is Count 1 of the issue, and that, therefore, Edison is entitled to an award of priority as to Count 1; that Macdonald, although possibly the first to conceive, was not diligent, and in fact has made no attempt to show diligence in reducing the invention to practice; and that Edison having actually reduced the invention to practice before Macdonald, and having presented ample reasons in excuse for his subsequent delay in filing his application, must be regarded as the prior inventor.

Respectfully submitted,

FRANK L. DYER,

For Edison.

[33016]